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Observations

ON THE

TREATMENT OF TRIGEMINAL NEURALGIA

ALCOHOL INJECTION OR OPERATION

BY

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It is now some twenty years since my first papers on this subject were published. In this interval my experience of many hundreds of cases has confirmed my view of the advantages which successful Gasserian injection has over any open Gasserian operation. I wish to emphasize this statement in view of the opinions that were expressed by surgeons at the discussion at the British Medical Association Meeting last July.

In a major operation, such as the Gasserian, there is always a possible risk of death, either from the anaesthetic, or from shock, embolism, or even from haemorrhage. Again, a certain amount of cerebral compression must occur during the process of brain retraction while the Gasserian root is being searched for, and I have seen such compression followed directly by hemiplegia, by aphasia, and by complete change of character in different cases operated on by front-rank neurological surgeons.

Mr. Jefferson referred to Hutchinson's modified ganglion operation as having "the extremely low mortality of 4 per cent." and to his own series of eighty-five cases with two deaths. This is far too high a mortality, and confirms my contention that ganglion injection, properly performed, is preferable. Mr. Jefferson further offered the opinion that alcohol injection of the ganglion "should be restricted to those who are judged to be physically incapable by reason of their age or of coexisting disease to undergo operation." I am, of course, unaware on what experience of injection of the ganglion this statement rests, as no facts or statistics were given, but the object of my paper is to demonstrate my reasons for considering the matter from the reverse point of view—namely, that no patient suffering from trigeminal neuralgia should undergo the open operation until it has been shown that a satisfactory injection of the ganglion cannot be performed.

First, the comparative risk to life. Since the modern methods of section of the posterior root have displaced the older resection of the ganglion itself, the danger to life from haemorrhage has undoubtedly decreased, and in the hands of an expert surgeon who has already performed this operation hundreds of times, the mortality may fall, as in Frazier's series, to 0.37 per cent. Even then, there is one death in 269 cases which would not occur if alcohol injection could be performed instead. Such a small percentage of fatalities might possibly be forgiven if it applied to all operations by this method, but it must be remembered that the surgeon has to perfect his technique at the expense of his patients, and that the risk to life is the price the patients pay for his skill.

Mr. Jefferson himself admits to two deaths in eighty-five cases, more than six times the mortality which he quotes as the present ideal. How much greater, therefore, is the risk of death likely to be for a patient in the first dozen cases that a surgeon undertakes; and is every surgeon who may be encouraged to attempt this operation likely to be as carefully trained in the technique of the operation as Mr. Jefferson? In his own words, "the operation of section of the sensory root is a very difficult operation to learn, and is at times an exceedingly difficult operation to perform." The obvious retort that might be made to me, as an advocate of alcohol injection, is that we too have to develop our experience and technique at the expense of our patients; but this is at no risk to life. The balance of risk is therefore obviously heavily against the open operation.

Secondly, loss of time, and nursing home and other expenses. Ten days to a fortnight is likely to be the minimum stay in home or hospital after the open operation, and the expenses are obviously very much greater for a private case. Rarely, moreover, will a patient be fit for work immediately on leaving hospital, and another fortnight will probably be spent in convalescence. With the injection method, one or two days is all that is necessary if carried out under morphine-scopolamine anaesthesia in hospital or nursing home; with local novocain anaesthesia only, I have injected the Gasserian ganglion in dozens of cases in my consulting room, and the patient is able to walk away perfectly fit and well, even with total trigeminal anaesthesia, requiring perhaps only a shade to be worn over the eye on that side for three or four weeks.

Just as experience and perfection of technique are necessary for the modern fractional root section for trigeminal neuralgia, so are they necessary for success in injections of the ganglion. Careful study of numerous skulls in the museum is an essential in the training of an expert in injection; he must also practise actual injection on the cadaver in the post-mortem room, using a coloured fluid, which he can trace after removal of the calvaria and brain. Not until he is familiar with this procedure should he presume to attempt an injection for a patient. It is the lack of experience and of careful study of the anatomy, and the attempts of physicians (and surgeons) to inject the foramen ovale, or rotundum, quickly under deep anaesthesia, that are largely responsible for most of the strictures which have been passed upon the injection treatment.

CHOICE OF AN ANAESTHETIC

In my opinion inhalation anaesthesia should very rarely be used for the injection treatment. It is an unnecessary risk in itself, and is quite unsuitable for a scientific injection of the nerve trunk or of the ganglion, inasmuch as no tests as to the degree of cutaneous anaesthesia obtained (if any) can be made until the patient is allowed to come round from the anaesthetic. If it is then found that no anaesthesia of the nerve to be injected has been obtained, then more ether or chloroform has to be administered, and vomiting generally results.

By far the most satisfactory method of inducing partial general anaesthesia, in order to perform the injection painlessly, is to administer morphine-scopolamine hypodermically about three-quarters of an hour before, and leave the patient, with blinds drawn, to become drowsy. Usually 1/4 grain of morphine and 1/150 grain hyoscine hydrobromide suffice, but with patients of 65 and upwards, who are not accustomed to morphine, often 1/8 grain is sufficient. By this method the patient is still semi-conscious, and can answer tests to pinprick during the progress of the injection, a most necessary guide to the correct finding of the nerve by the needle, and for deciding the amount of alcohol to be injected after the nerve has been found.

Some patients may require a second dose of morphine and hyoscine before they become suitably drowsy, especially if morphine has been used in the treatment of the neuralgia. In that case I inject another dose of 1/8 grain or 1/4 grain of morphine, according to the conditions, with 1/150 grain of hyoscine, and wait another twenty minutes before commencing the injection. This entails a certain amount of patience, but care and patience are essential for good results in alcohol injections, and more particularly when the Gasserian ganglion is the

objective. The surgeon or physician who quickly pushes his needle to the base of the skull, under deep anaesthesia, and then injects 15 or 20 minims of alcohol, saying he has injected the foramen ovale, is deluding himself nineteen times out of twenty, as is proved in so many cases by the absence of any cutaneous anaesthesia afterwards. Very occasionally he may by good luck strike the foramen, and if he then injects such a quantity of alcohol through the foramen it is very likely to burst through into the lateral recess and cause serious cranial nerve paralysis, as I have known occur more than once. No one can be certain, by the feel of the needle against the base of the skull, when the point engages the foramen ovale. It may be thought that the needle has hit the foramen, and very possibly that may turn out to be correct, but much more often it is otherwise, and the needle has to be readjusted perhaps several times before the foramen is definitely found. Therefore I say most emphatically that alcohol injection to the deep foramina under complete general anaesthesia is an uncertain and unscientific method. Long experience has convinced me that the only correct method is to use either local novocain anaesthesia, as a preliminary to the alcohol, or local novocain combined with morphine-scopolamine partial general anaesthesia. By this means the patient is able to indicate when the nerve is reached, and injection then of a few drops of 2 per cent. novocain proves within half a minute whether the point of the needle is within the nerve or not by the resultant cutaneous anaesthesia quickly appearing on lower lip, chin, and half of the tongue. This is practically a painless method, and alcohol is then injected to complete the destruction of the nerve which has been anaesthetized by the novocain.

With ether or chloroform inhalation anaesthesia one always feels a little hurried, and the use of the mask on the face and the position of the anaesthetist interfere with the free manipulation of the needle that is required. With morphine-scopolamine anaesthesia the greatest deliberation of movement is easy ; vomiting never occurs during the operation, though this complication is common with an inhalation anaesthetic, when the patient is allowed to come round for testing purposes. If the proper amount of morphine and hyoscine is used, and sufficient time allowed, its general anaesthetic action is ideal ; no pain is felt, and the memory of the operation is afterwards often entirely obliterated, though at the time sufficient consciousness is preserved for fairly reliable answers to be given to tests for anaesthesia to pinprick on the lips, chin, or cheek.

Many patients prefer to have the injection under local novocain only, without general anaesthesia, and it can then be done in the sitting position in a comfortable armchair in the consulting room. For this purpose I have had a special armchair made to my own design by Messrs. Maple, which ensures that the patient's arm, on the side operated on, cannot interfere with the operator. These patients will often admit, if asked, that the pain of the injection is not sufficient to make a general anaesthetic worth while, as it is much less severe than the neuralgic spasms they are constantly suffering. If, however, the patient is nervous, especially if a woman, then a preliminary morphine-hyoscine injection is advisable, but this should be done with the patient in bed, sitting propped up with pillows, not on an operating table. Some persons require more morphine than others to induce the required stage of quiet somnolence, and over the age of 65 I generally use only 1/8 grain, as I find with the larger dose that old people more easily slip into a condition of complete unconsciousness, as if chloroform or ether were used, and then they are totally unable to react to tests, and it is a matter of chance whether the nerve is injected properly.

METHOD OF INJECTION

It is very important to inject the alcohol slowly, not more than two minims at a time, and watch the results, testing the spread of the resultant anaesthesia with a pin before injecting more. Often it will be noticed that, even without passing the needle through the lips of the foramen ovale into the ganglion itself, the anaesthesia is spreading beyond the area of the third division over the cheek, forehead, and eye, indicating infiltration of the whole of the ganglion. Thus, the patient may begin to blink, and if questioned will complain of a sensation of a hair or foreign body in the eye. This always indicates commencing anaesthesia of the eye and cornea. A curious fact commonly observed with such injections of the foramen ovale is that the ophthalmic division of the ganglion becomes anaesthetic earlier and more completely than the second division. To correct this, the needle must be pushed another quarter of an inch through the foramen into the ganglion. Before injecting any more alcohol the needle should then be watched, after removing the stylet, to see if any clear cerebro-spinal fluid drips through it. If this is the case no alcohol must be injected, for the point of the needle is in the cave of Meckel, not in the tissue of the ganglion. The needle must be withdrawn partially and reinserted in a slightly more backward direction. If no clear fluid now drips, then two drops of novocain solution, followed by alcohol, should be injected, and the effect noted.

By this means it is usually possible to destroy the middle portion of the ganglion corresponding to the second division of the nerve. Very often the whole trigeminal area becomes rapidly totally anaesthetic after the first injection of a few drops of alcohol only, and permanent total anaesthesia of all three divisions may occasionally be obtained with as little as five or six minims. More often, after the lapse of five or ten minutes, sensation may return completely over the first and second divisions. This is due to what I call " ganglion shock," and the process may be repeated two or three times with renewed injections of two or three minims, until permanent lasting anaesthesia is produced. A curious feature which I have met with many times, and which is difficult of explanation, is that while the initial injection of a few minims may produce total trigeminal anaesthesia by ganglion shock, yet after the anaesthesia has faded off the first and second divisions after ten minutes or so, the needle remaining stationary, renewed injections may fail entirely to reproduce the anaesthesia of the upper two divisions. This is probably due to faulty position of the needle in the ganglion, as I have often found that readjustment of the needle has led to permanent ganglion anaesthesia.

Although in the majority of cases it is possible to inject the ganglion by the route through the side of the cheek and the sigmoid notch, yet occasionally the mandible is set so high in relation to the floor of the skull that it may be impossible to pass the needle by this route through the lips of the foramen ovale. In such a case, when it is desired to inject the ganglion, and not the third division only, no alcohol should be injected after the third division has been anaesthetized by novocain ; the needle should be withdrawn, and when the novocain anaesthesia has passed off a fresh attempt should be made by the anterior route described by Härtel. For this a longer needle is necessary, such as $3\frac{1}{2}$ inch instead of the usual $2\frac{3}{4}$ inch. A point should be taken in the vertical line with the outer canthus, and below the malar bone, the needle being directed backwards, slightly inwards, and upwards. This route gives a steeper line of approach to the foramen ovale, and ensures penetration of the foramen when reached, but I prefer the shorter route when possible, as it is easier and there is less risk of a troublesome haematoma.

Neuralgias limited to the third division alone sometimes remain totally free from all pain for many years after injection of the third division of the fifth nerve only; this is probably due to the alcohol infiltrating the outer portion of the ganglion and destroying permanently some of the neurons of this third portion. Though it is probable that some cases of injection of the third division only at the foramen ovale may remain permanently cured (one lady is still free although it is twenty-three years since I injected her), yet recurrence of the neuralgia may sometimes happen after several years' freedom. I have seen such recurrence after nine, thirteen, and fifteen years in different cases. It is on account of this, especially in second-division neuralgias, that of late years I have been more and more inclined to inject the ganglion in all cases, and thus to try for a permanent cure, rather than risk the probable recurrence of the neuralgia at some future date. During the past twenty-two years since I first injected the Gasserian ganglion for neuralgia, I have treated in this way several hundreds of cases, many of which I know, and a considerable proportion I believe to have been permanent cures, though it is impossible to keep track of large numbers of cases, especially those seen at hospital.

Excluding hospital cases, I have attempted, during the last twelve months, to inject the ganglion in 45 cases in my private practice, apart from other cases of neuralgia in which only the second or third division was intentionally injected; 13 of these 45 resulted in total and apparently permanent anaesthesia of all three divisions. In 8, in which the neuralgia affected the second division, with or without the first, I was able to inject the inner two-thirds of the ganglion, producing total anaesthesia over the upper two divisions of the trigeminal area, but permitting the escape of the third division, wholly in some, partially in others. Fig. 1 illustrates the average area of trigeminal anaesthesia after total ganglion injections. The anaesthesia is total to pin and to pressure in front of the line A B C, a narrow area of diminished sensibility separating the total loss from the normal. Very occasionally the supra-orbital area of analgesia to pinprick may extend as far back as the occiput. In one case the tympanic membrane and anterior wall of the auditory meatus were totally anaesthetic, but usually the sensitiveness is only diminished.

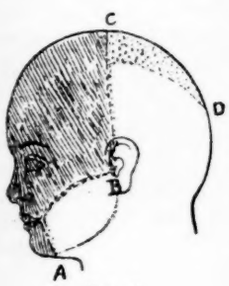

FIG. 1.

In 5 other cases total temporary ganglion anaesthesia was produced, but partially faded off the upper two divisions, leaving total third-division anaesthesia, and loss to pinprick only on the upper two. In 7 more total permanent anaesthesia resulted on the second and third divisions, with partial loss over the ophthalmic division. In another case, in which the pain was entirely limited to the second division, I was able to inject the middle third of the ganglion only, causing total anaesthesia of cheek, side of nose, upper lip, and palate, but practically none on the forehead or eye, lower lip or tongue. In 5 more cases total third-division anaesthesia was obtained, but only partial loss on V.2 and V.1, while in 3 I failed to obtain any ganglion anaesthesia at all, or to pass my needle through the foramen ovale. In these I had to be content with injecting the third and second divisions separately at the foramen ovale and foramen rotundum. This can usually be done fairly quickly after injecting the third division, by partially withdrawing the needle, turning it forwards and pointing to the external canthus, so as to slip in front of the external pterygoid plate, and there to pierce the superior maxillary nerve just after its emergence from the foramen rotundum. I find this posterior route usually more satisfactory than passing the needle in front of the coronoid process; there is less risk of haematoma, and the same puncture is used as for the foramen ovale. In the remaining 3 cases, while in all there was temporary total ganglion anaesthesia, only partial lasting anaesthesia resulted in either division.

In all the cases the neuralgia was arrested. That the cure will be permanent I do not pretend, but it will certainly be permanent in the 13 cases of total ganglion anaesthesia, and probably in the 8 cases of total anaesthesia of the upper two divisions, and the 7 cases of total second- and third-division anaesthesia. Some of the 10 cases of total third-division anaesthesia may also escape recurrence, but in the 3 in which there was only incomplete anaesthesia of any division the probability of recurrence at some future date is considerable. It will be very interesting to watch the careers of my 2 cases (1 in hospital) in which only the middle third of the ganglion has been destroyed by the alcohol, causing anaesthesia over the second division only.

Thus of 45 private cases in the last twelve months I failed to inject the ganglion in 3 only, or 7 per cent., having to be content with injecting the separate branches. In 28 cases, or 62 per cent., there is very considerable probability of a permanent cure, and a fair chance in another 10 cases, or 22 per cent., making 84 per cent. of cases in which the chances of a permanent cure may be called reasonably good.

POSSIBILITY OF RECURRENCE IN INCOMPLETE GANGLION OR ROOT DESTRUCTION

I have seen recurrence of second-division neuralgia nine years after I injected the inner two-thirds of the ganglion, causing total permanent anaesthesia of the first division, with fairly dense partial anaesthesia of the second branch. After nine years the first division was still totally anaesthetic, but sensation was again normal on the other two divisions. Reinjection of the ganglion again produced moderately dense anaesthesia of V.2 and V.3 with complete relief of the pain.

The longer my experience, the more I feel convinced that there can be no guarantee against eventual recurrence of neuralgia unless there is produced total and permanent trigeminal anaesthesia. It is true that many cases go free for a great many years with much less than total anaesthesia, and others may be permanently cured, but so long as there is some conduction of sensation remaining on either of the two lower divisions, and even of the ophthalmic division, the possibility of recurrence must be reckoned with. Hutchinson's operation of leaving intact the inner portion of the ganglion, originally an unintentional omission of removal of the whole ganglion which he set out to do, but afterwards repeated as his usual method, left normal sensation over the first division, thus avoiding the risk of keratitis. I have met with three cases thus operated on, in which recurrence of the neuralgia appeared from two to ten years afterwards. Similarly, for the fractional root resection method as elaborated in America and advocated by Mr. Jefferson, though the majority may turn out to be permanent cures, yet I feel sure that recurrences will be met with, and a second operation for the recurrence of neuralgia is likely to be far more difficult than the first. Of Dandy's 200 cases, operated on by the subcerebellar route, 3 recurrences were noted, and I observe that Cushing, in his remarks at a meeting of the American neurological surgeons in the discussion on Dandy's paper, stated that he himself still practised resection of the entire root.[1]

In those cases of ganglion injection in which I have injected the inner portion of the ganglion, and left the third division with full sensation, should recurrence of the pain happen a further injection should be as easy as on the first occasion, as the sensory guide of the third division is unimpaired. I have frequently heard the statement repeated that though the first alcohol injection may be satisfactory for a time, a second injection is of no use. This is quite untrue, except in cases which have been so frequently injected that a condition of fibrosis in the zygomatic fossa has been set up, which renders manipulation of the needle difficult; there is no possibility

[1] *Arch. of Neurol. and Psychiat.*, 1932, xxvii, 22.

of the nerve becoming immune to alcohol. The worst case of fibrosis I have met with was in a lady who, some years before the war, had been operated on and who carried her "ganglion" with her in a little spirit bottle. Her neuralgia was unchanged, and there was no trace of facial anaesthesia. Injection was quite impossible, so I asked Sir Victor Horsley to operate, which he did quite successfully, finding the real ganglion quite untouched.

Such fibrotic cases are particularly impossible to inject satisfactorily, and the open root-section operation is then the only remedy. As I have already said, in a certain proportion of other cases it will no doubt be found impossible to obtain satisfactory ganglion anaesthesia, and root section will probably be required sooner or later, but in a large proportion of cases of trigeminal neuralgia it will be found possible to obtain dense or total ganglion anaesthesia, probably in over 80 per cent., either by the route I usually use through the sigmoid notch, or by the longer anterior route. Anaesthesia that has persisted unaltered for a month after injection of the ganglion may be considered as permanent and unlikely to diminish to any marked extent.

Care of the Cornea

When the first or ophthalmic division remains totally anaesthetic, there is a risk of neuroparalytic keratitis supervening, unless the eye is protected for the first few weeks. A shade over the eye, or goggles, should be worn from the first, and the eye should be bathed with warm boric lotion twice daily. No soft pad of any kind is to be allowed between the eye and the shade, as the anaesthetic cornea would be liable to rub against it and be destroyed. If keratitis appears, the outer halves of the lids should be "rawed" and sewn together, and kept fastened for three months at least. Closing the lids is a sure cure for the keratitis if the latter is not allowed to progress beyond the initial stage of loss of the superficial epithelium in the centre of the cornea; such a shallow ulcer disappears entirely within twenty-four hours after closing the lids, and no scar whatever results.

PARTIAL INJECTION OF THE GANGLION

Although partial destruction of the ganglion, or of the sensory root, is not a certain and permanent cure for the neuralgia, whether obtained by the open operation or by alcohol injection, yet it is often advisable to inject only the outer two-thirds or the inner two-thirds of the ganglion, according to whether the neuralgia affects mainly the third division or the second division of the nerve. In a certain number of cases it may be considered too risky to endanger the sight by producing total anaesthesia of the cornea when the sight of the other eye has already been partially or wholly lost through accident or disease. Great care must then be taken to inject very slowly, and not to push the cutaneous anaesthesia beyond the recognition of pressure on the upper eyelid and forehead.

In another large group of cases the incidence of the neuralgia is entirely restricted to the third division of the nerve, never invading the upper lip or nose. In these again a permanent cure may be obtained by a successful injection of the outer two-thirds of the ganglion, so as to produce total third-division anaesthesia with moderately dense anaesthesia of the upper lip, cheek, and upper jaw, and little or no anaesthesia of the eye or of the rest of the upper division. This I have done in a large number of cases, many of which are still completely free from pain since the injections were done, fifteen to twenty years ago.

First-division neuralgia never complicates third-division neuralgia unless the second division is also involved, and first-division neuralgia probably never exists alone without the pain ultimately declaring itself over the territory of the second division. The longest time I have known the distribution of the neuralgia to be strictly limited to the first division, before the pain spread into the nose and lip, is four years. It should be unnecessary to mention that true tic first-division neuralgia, existing alone, must be very carefully distinguished from other forms of periodic pain, such as sinus infection and migrainous neuralgia.

Again, second-division neuralgia frequently refers along the eyebrow and lower half of the forehead, in addition to the temple, upper jaw, ala nasi, and upper lip, and yet may disappear entirely after an injection of the second division alone at the foramen rotundum. Such a distribution of the pain invading the lower half of the forehead, without involving the eyeball or shooting to the top of the head, should not be regarded as necessarily involving the first division unless it persists after a successful injection of the second division.

NEURALGIA OF THE SECOND AND FIRST DIVISIONS

Just as in many cases the neuralgia is limited to the third division, so in an approximately equal number of cases it may be limited to the second division, and in a small proportion of cases the first division is definitely involved together with the second. In the latter case, it is a quite safe and very suitable procedure to inject the inner portion of the ganglion to produce anaesthesia of the forehead, eye, and upper jaw, and yet leave good sensation on the lower jaw, lower lip, and tongue, which adds very considerably to the comfort of the patients afterwards when eating. This I have done on many occasions, my method being to use novocain only for injecting the third division when found at the foramen ovale, and not to inject alcohol until the needle has been pushed inwards for another quarter of an inch through the foramen ovale. I have thus produced very satisfactory deep and permanent anaesthesia of the upper two divisions, while the sensation returns over the lower jaw and tongue practically completely in an hour or less, as soon as the novocain anaesthesia wears off. Should neuralgia ever return in these cases, or should it later invade the third division, reinjection will be as easy as on the first occasion, because the sensitiveness of the third division as a guide is unimpaired.

FIG. 2

Fig. 2 illustrates anaesthesia resulting from injection of the inner two-thirds of the ganglion in a woman, aged 68, who had suffered for fourteen years from severe neuralgic tic affecting the first and second divisions. The ganglion was injected on July 27th, 1931; the next day there was no sensory loss on V.3 and no motor paresis. The condition was still unchanged seven months later, with total sensory loss on V.1 and V.2, and complete relief of pain.

I have also used this method in a few cases of persistent post-herpetic frontal neuralgia, when there was troublesome hyperaesthesia of the forehead. In such cases the intense persistent hyperaesthesia is often more cause of complaint than chronic pain, and anaesthetization of the inner portion of the ganglion gives considerable relief.

INJECTION OF THE MIDDLE THIRD OF THE GANGLION

Although injection of the third division alone at the foramen ovale is often most successful in neuralgia limited to that division, probably due to the outer part of the ganglion being also partially destroyed, yet the history of second-division neuralgias injected at or in front of the foramen rotundum is usually less happy, recurrence

often taking place in six to twelve months according to the density of anaesthesia produced, with a small proportion lasting from two to three years. One of my cases is still free after ten years, and I have seen four and five years' remission, but these longer periods are unusual.

I have therefore been more inclined for some time past to recommend and to practise injection of the inner portion of the ganglion, in order to obtain a lasting cure. I observe that Mr. Jefferson has divided the middle portion of the sensory root in two or three cases, in order to limit the anaesthesia to the area of the second division, and during the past six months I have in two cases successfully injected the middle portion of the ganglion only—in a man, a private patient, and in a woman at Maida Vale Hospital—for second-division neuralgia. My method is similar to injecting the inner portion of the ganglion, but after pushing the needle through the foramen into the ganglion, the alcohol must be injected even more slowly and carefully than usual, waiting perhaps for ten minutes at a time after each injection of two minims, and testing repeatedly with a pin as a guide to the developing anaesthesia. In both cases total shock anaesthesia of the upper two divisions developed at first, but after ten minutes sensation began to return. More alcohol then deepened the anaesthesia on V.2 but did not affect V.1, and gradually more and more injections of one or two minims at a time produced total lasting anaesthesia over the second division alone, which was unchanged a week later.

Fig. 3 illustrates anaesthesia resulting from injection of the middle third of the ganglion, in a man, aged 57, who had suffered from flashing pain from the right upper lip to vertex for the past five years: 0.9 c.cm. 90 per cent. alcohol was injected on January 13th, 1932. There was total anaesthesia to pin and pressure on infra-orbital area, upper jaw, and palate as far back as middle of soft palate, and slight numbness and diminished sensibility to touch over the temporo-malar area. Anaesthesia was unchanged eight days later.

FIG. 3

Since I first injected the Gasserian ganglion in 1910 for trigeminal neuralgia, I have treated by this method some hundreds of patients, many of whom have been free of all pain for a number of years, and may be considered as permanent cures. When the injections are done by the methods I advise, slowly and with great care and patience, using light morphine-scopolamine anaesthesia, or local novocain only, according to the temperament and wishes of the patient, the results are most gratifying both to the operator and to the patient, while there is no risk whatever to life, and a minimum of expense and time.

DISLOCATION OF THE PATELLA*

BY

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Dislocation of the patella is a comparatively rare condition, but it is nevertheless one of great interest on account of the factors involved in its cause and treatment.

AETIOLOGY OF OUTWARD DISPLACEMENT

Cases have been recorded of displacement occurring upwards or downwards, or inwards or outwards, but as outward displacement is by far the most common and the one which is found as a congenital condition, I am proposing to confine my paper to this variety.

Apart from the single traumatic dislocation, outward dislocation of the patella naturally divides itself into two main groups:

1. *Congenital*, in which the patella is permanently displaced and fixed on the outer side of the femur.
2. *Recurrent*, in which the displacement occurs either at infrequent intervals or as frequently as the knee is put through its range of movement.

It is generally accepted that the patella is a sesamoid bone in the tendon of the quadriceps. As Mackenzie[1] has said, its function is to improve leverage and thus increase the power of the muscle. It acts as a pulley and, by enabling the quadriceps to work at an angle, increases the work done by each contraction. The patella is an integral part of the extensor mechanism of the knee-joint—in dealing with its displacement, therefore, it is necessary to consider this mechanism in some detail.

THE EXTENSOR MECHANISM

The extensor muscle of the knee is the quadriceps. It consists of four muscles—the rectus femoris, the vastus externus, the vastus internus, and the crureus. All are supplied by branches from the anterior crural nerve, but these branches are so widely separated from one another in their distribution that they can be considered and injured as individual nerves. To obtain insertion, the tendons of the four muscles unite and become attached through the ligamentum patellae to the tuberosity of the tibia. In addition, fibrous expansions on each side are attached to the capsule of the joint and to the anterior surface of the upper end of the tibia and the fibula. These are called the lateral patellar ligaments. On looking at the quadriceps and its attachment as a whole, one notices, as Goldthwait and others have pointed out, that in full extension the line of pull of the muscle makes an angle with the line of the patellar tendon. This angle is obtuse outwards, and is caused by the fact that when the knee is in the extended position the tibia and the femur are not in line with one another. For in this position the width of the pelvis and the length of the femoral necks separate the upper ends of the shafts of the femora while the lower ends are in close proximity. This would naturally result in an obliquity of the knee-joint, which, however, is prevented by a relative increase in the length of the internal condyle of the femur. This makes the joint horizontal, but results in throwing the femoral shaft out of alignment with that of the tibia. When the knee is flexed, though, the same conditions do not obtain, and the tibia and femur take up positions which become approximately parallel to one another. As the quadriceps clothes the shaft of the femur and the patellar tendon takes the line of the tibia, there must be an angle, more acute in the female than in the male, between the line of the muscle and that of its tendon, when the limb is extended (Fig. 1).

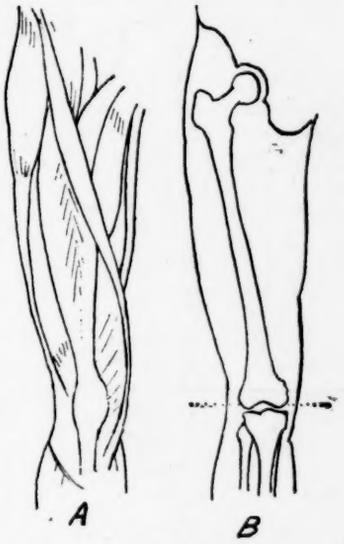

FIG. 1.—A, Showing angle between line of quadriceps and that of patellar tendon; and B, the alignment of the femoral and tibial shafts.

*From a paper read at a meeting of the British Orthopaedic Association at Nottingham, April 22nd, 1932.

When one observes the quadriceps contracting, one can see that as the knee extends the patella first travels in a straight line over the patellar surface of the condyles, but that as full extension is reached it is pulled laterally. This lateral pull at the completion of extension produces a very definite movement and would cause a dislocation of the patella were there not some natural means of preventing it.

What, then, prevents dislocation? It is primarily prevented by two factors:

1. The size of the patellar surface of the outer condyle of the femur.
2. The broad attachment of the patellar tendon and its inner lateral ligament to the upper end of the tibia and to the capsule of the joint.

These factors, therefore, both act as checks, preventing dislocation when the quadriceps contracts.

FACTORS FAVOURING DISLOCATION

It follows, on theoretical grounds, that the possibility of dislocation would be increased by anything which decreased these checks, or by anything which increased the angle between the muscle and its tendon. In other words, the possibility of dislocation would be increased by:

1. Diminution in the size of the external condyle.
2. A rupture or weakness of the internal part of the capsule and of the internal patellar ligament.
3. Weakness of the vastum internus (making the line of the quadriceps more angular).
4. A lateral attachment of the patellar tendon.
5. Genu valgum, laxity of the patella, or hyperextension of the knee.

It has been found, in fact, that one or more of these causes are usually present when dislocation occurs.

The patellar surface of the external condyle of the femur is a very important factor in preventing dislocation, and when I was considering the possibility of the presence of some developmental abnormality, as a cause of congenital dislocation, it was suggested to me that some assistance might be obtained from comparative anatomy. I have therefore compared the femora of certain quadrupeds with those of the baboon, gorilla, and man, and have found as the result of these observations that in man alone is the anterior surface of the external condyle definitely larger than the internal. In the cow, the dog, and the sheep the internal condyle is the larger, while in the baboon and in the gorilla there is very little difference. And this is of great interest when one remembers that, apart from man, all walk with flexed knees. (Fig. 2.)

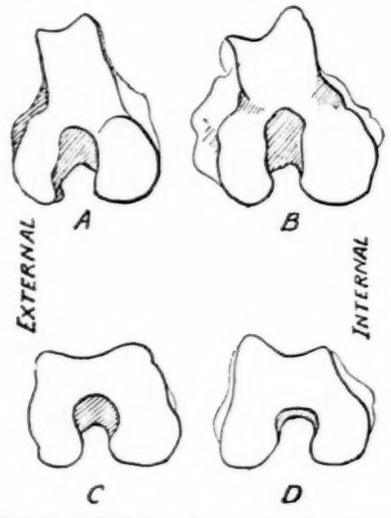

FIG. 2.—Lower articular surfaces of right femur of: A, sheep; B, cow; C, gorilla; D, man—showing alteration in relative sizes of internal and external condyles.

Their femora are approximately in alignment with their tibiae; there is consequently no angle between the extensor muscle and its insertion, and therefore no lateral pull. If these observations are correct, the relative increase in the size of the external condyle has occurred with the advent of the erect posture, and the lateral pull to which the human patella is subjected at the termination of extension is not present in the quadrupeds. If this is so, it seems not unreasonable to suggest that it indicates that the human quadriceps has acquired a new function. In the process of walking, the knee, having been extended, has to be held in the extended position for a momentary period when a forward step is taken. May it not be that the quadriceps is able to maintain this with a minimum of effort as a result of the lateral pull on the patella with a pulley action round the external condyle of the femur? Though the crucial ligaments and the rotation of the tibia lock the knee in extension and prevent hyperextension, may it not be that this mechanism locks the knee in extension and with the minimum of effort momentarily prevents flexion?

When the quadriceps is very weak or completely paralysed transplantation of the insertion of the biceps to the patella places this muscle in an ideal position for producing this lateral pull. It is possible that this accounts for the variation in opinion as to the value of this operation. A transplanted biceps, though not strong enough to extend the leg against gravity, may, on this theory, be strong enough to hold the knee extended for a momentary period and so enable walking to be done without the need of an instrument.

The lateral pull of the quadriceps may also account for the occurrence of congenital dislocation of the patella. For if the external condyle has retained its primitive size, the first contraction of the quadriceps, either *in utero* or after birth, may by its lateral pull dislocate the patella outwards and this may subsequently become fixed in the displaced position by secondary contractures. One of my *x*-ray photographs appears to support this suggestion. In this it can be seen that the external condyle is smaller than normal. It is, however, impossible to say whether this condition was present at birth or whether the under-development is due to lack of functional use. That the congenitally dislocated patella is sometimes associated with bony abnormalities is certain and it is itself sometimes abnormal, being occasionally rudimentary in size and occasionally double.

Dislocation of the patella may be also associated with a hereditary abnormality as illustrated by a group of cases reported by Moore.[2] In this group cousins married, and cases of recurrent dislocation of the patella occurred in several succeeding generations at the age of 9 or 10. Moore investigated one of these cases and found that the vastus internus was under-developed.

SYMPTOMS

These may vary considerably. In the traumatic cases there may be pain with sudden inability to walk, and, if unreduced, inability to straighten the knee. In the recurrent type not associated with trauma there may be no pain but great weakness of the leg. In the congenital type it is usually noticed that the shape of the knee is not normal and the child is ungainly in walking and frequently falls. I am able personally to report seven cases—of these, three had bilateral dislocations, five were congenital, and two recurrent. Of the congenital cases, one had double patellae, and in one the patellae were rudimentary. In the recurrent cases there was definite wasting of the vastus internus, probably due to infantile paralysis. Five of the patients were girls and two boys.

METHODS OF TREATMENT

For the single traumatic dislocation, reduction, followed by fixation for a time with the knee in the extended position, may be all that is necessary. For the recurrent and the congenital case, however, operative treatment is indicated. In discussing the causes of dislocation, emphasis has been laid on the importance of the external condyle both as preventing dislocation and as making walking possible with a minimum of effort. It might appear, therefore, that the first step in treatment should

be to increase the size of the external condyle of the femur, and, indeed, if the displacement did not involve any other factors, an operative increase in the size of the condyle might be all that was necessary. That, however, is usually not the case, although in the recurrent type of dislocation, where secondary factors are not involved to the same extent, Brackett and Albee have increased the size of the condyle by a bone graft, with good results. For the recurrent type, other methods have also been used with the object of altering the position of the patellar tendon, by transplanting the inner or the outer half or the whole tendon inwards. Supracondylar osteotomy of the femur with rotation of the lower end has also been done. Thinking that the weakness was in the capsule, some have plicated this or have transplanted a surplus from the inner to the outer side of the joint. Others again have, by fascial slings, attached the patella to the inner side of the femur, or have transplanted the gracilis on the semitendinosus to the inner side of the patella.

These methods are all said to have given good results in the recurrent type of dislocation, where the problem is not to replace the patella, but merely to hold it in position.

The Congenital Type

In the congenital type, however, something more is needed, and for these Mouchet[3] has devised an operation in which the patella and its tendon are detached from their displaced positions and threaded through the capsule of the joint. The tendon is then reattached to the tibia at a point on its inner side. In this operation no attempt is made to realign the muscle.

It is obvious that in treating a congenital dislocation three objects should be kept in view:

1. To replace the patella.
2. To correct the line of pull of the quadriceps and of its tendon.
3. To maintain it in position.

It would seem, therefore, that the first step should be to realign the muscle and its tendon, and the second, to increase the size of the external condyle. In my experience, however, realignment of the muscle carried out by the method which I shall describe has in itself been quite sufficient to prevent recurrence of dislocation, and has enabled the quadriceps to function normally. The method, which has probably been used by many surgeons, consists of a combination of some of those already mentioned. I first saw it performed by Mr. Emslie, and him I have to thank for permission to report one of the cases in my list.

The aim of the operation is to replace the patella, freeing the outer side of the quadriceps and at the same time transplanting the tibial tuberosity inwards and displacing the patella to a slightly lower level than normal. (I have, where necessary, done a simple supracondylar osteotomy to correct genu valgum at a preliminary operation. This is sometimes not easy, and might with advantage be done at a subsequent operation.) The skin incision is made on the outer side of the thigh, extending from the middle third and curving slightly inwards, to end internal to the anterior border of the tibia 1 inch below the tibial tuberosity. Through this skin incision the outer border of the quadriceps is freed. The capsule on the outer side of the patella is divided, and this division is carried downwards through the periosteum on the outer side of the tuberosity for about 1½ inches—the periosteum on the inner side of the tuberosity is also divided for a similar distance. With a chisel the patellar tendon, together with a flake of bone, is raised from the tibia, leaving its lower end attached to the periosteum and so maintaining the tension of the muscle. A raw area is then made on the surface of the tibia on the inner side of the tuberosity.

As the outer side of the lower part of the quadriceps muscle and the tendon are now free, the patella can be pulled over to the inner side and placed in its normal position, and the muscle realigned. This produces a gap in the capsule on the outer side, with a surplus of capsule on the inner side. This surplus is detached as a flap with a proximal pedicle and is drawn under the rectus femoris to the outer side of the joint. By sutures on its inner side the patella and its tendon are then fixed in position, the bone attached to the tendon being applied to the raw area on the tibia. The effect of this is to bring the patella to a slightly lower

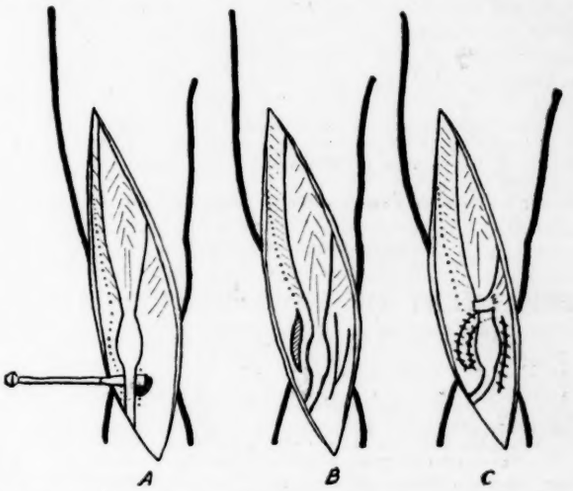

FIG. 3.—Steps of operation. A, Freeing outer border of vastas externus and both sides of patellar tendon, and making a raw surface on inner side of tibia. B, Muscle and tendon displaced inwards. C, Sutured and so held in position, the surplus capsule being displaced from the inner to the outer side of the joint.

level than normal. Part of the displaced flap of capsule is then sutured in position to fill the gap in the capsule on the outer side, and as an added precaution, though it is not essential to the operation, part is brought back over the rectus and sutured to itself, thus forming a sling. The wound is then closed. (Fig. 3.)

The after-treatment consists in fixing the knee in the extended position until the wound is healed—then gradually commencing movements, and walking in a calliper.

In my experience this method has been used six times, two cases being recurrent and four congenital. Of these,

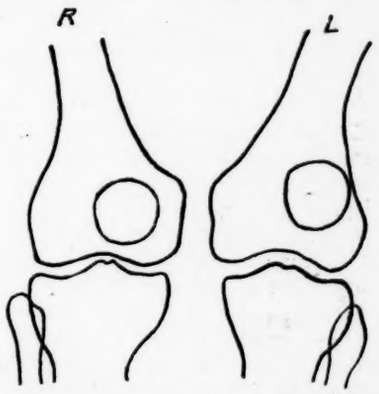

FIG. 4.—Line drawing from *x*-ray after operation on right leg, showing displacement of patella downwards and inwards.

the last was done too recently to allow of a report on its success or otherwise, but the remaining five have been completely successful. One was done 10 years ago, two 6 years ago, one 4 years ago and one a year ago. In none has there been any sign of recurrence, and all have full movement. (Fig. 4.)

SUMMARY

My conclusions are that dislocation of the patella is predisposed by the erect posture and may be due to imperfect development of a recently acquired function of the quadriceps. It results from an abnormality which may be present in: (1) the muscle itself; (2) the articular surface of the femur; (3) the attachment of the patellar tendon to the tibia.

A satisfactory and simple method of correcting this is to displace the muscle and its tendon inwards and to transplant the tibial tuberosity in such a way that the patella is brought down below its normal position. This ensures stability and enables the quadriceps to work with the maximum of efficiency.

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TREATMENT OF CHRONIC SUPPURATIVE DISEASE OF THE MIDDLE EAR *

BY

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I have chosen the subject of the chronically discharging ear for a number of reasons. First of all this is a common disease. In many cases it resists all forms of treatment, and runs its course, not for months, but for years, and a chronic discharge inevitably leads to disability in the shape of hearing—a disability which, in certain cases, becomes profound. Moreover, although intracranial complications are comparatively rare, yet they do arise, and make up for their infrequency by the high rate of mortality.

There is still another reason why I have chosen this subject, and it is that treatment is apt to become stereotyped. We rely on one or two forms of drops, or, alternatively, a course of syringing. Both may be completely inefficient. In this disease treatment must be adapted to the particular case. Each ear has to be separately studied, and an attempt has to be made in every instance to determine the various causes of the chronicity.

THE MIDDLE-EAR CLEFT

The "middle ear" must be understood to include the whole of the middle-ear cleft, which starts in the nasopharynx, runs up the Eustachian tube, enters the middle ear or tympanum proper, invades the upper regions of that cavity which is known as the attic, and from there leads upward through a small tunnel or aditus into the mastoid antrum. From the antrum, in the majority of cases, open numerous air cells which extend throughout the temporal bone and carry the infection to the neighbouring portions of the cranium, to the meninges of the middle and posterior fossae, to the cerebrum and cerebellum, and to the venous sinuses. The nasopharynx, Eustachian tube, attic, aditus, antrum, and air cells are lined throughout by one continuous membrane. The mucous membrane, it is true, differs in different parts—for example, in the Eustachian tubes and in the interior of the tympanum itself it is rich in mucus-secreting glands, whereas in the posterior part of the tympanum, in the mastoid antrum, and in the air cells, it is thin and deficient in glands.

In a case of chronic discharge from the middle ear, it is necessary to determine in which part of the middle-ear cleft lies the origin of the chronicity. For example, if the cause is in the nasopharynx—perhaps, an infected pad of adenoids—the treatment will have to be aimed at this. If, on the other hand, the condition is due to an osteomyelitis involving the mastoid process, and mastoid antrum and air cells, the removal of adenoids will be of no benefit, and treatment will have to consist of some form of mastoid operation.

SITES OF INFECTION IN CHRONIC OTITIS

I want to describe five typical situations, with the differential diagnosis of each. I shall deal, first, with a chronic discharging ear following a recurrent infection of the nasopharynx; secondly, with a discharging ear due to chronic infection of the mastoid antrum and air cells; thirdly, with a case in which the bulk of the disease lies chiefly in the region of the attic; fourthly, where the tympanum itself bears the brunt of the trouble; and, fifthly, where there is gross involvement of the whole of the middle-ear cleft. Each situation gives a perfectly clear and distinct clinical picture, and the majority of discharging ears can be placed definitely in one or other of these five classes.

FOCUS IN THE NASOPHARYNX

In the first group a focus of infection in the nose or throat leads to a recurrent infection of the Eustachian tubes and of the middle ear. A typical history is that of a *recurrent* discharge in a child, usually starting with a cold or sore throat. This is quickly followed by an attack of pain in the ear. If this is the first attack, the pain is frequently severe and lasts a few hours or even one or two days. In the untreated cases relief is finally obtained when the drum gives way before the accumulated pus in the middle ear, and a free discharge passes into the meatus. If the attack is one of a series, the pain in the ear is often slight—even absent—and of short duration. The drum, which has been ruptured before and has healed over with a thin scar, easily gives way, and the discharge starts with corresponding ease. After the ear has discharged the patient is relieved, the pain subsides, the temperature—which has been high at the onset—soon returns to normal, and the child recovers from the acute phase.

The character of the discharge, as well as the history, helps in forming the diagnosis. I have already mentioned that the mucous membrane of the Eustachian tubes is rich in mucous glands. A discharge which is due to infection of the tubes is consequently mucous and, later, muco-purulent. It is thick and sticky, adhesive and tenacious, and can be pulled out in long strands from the meatus. The site of the perforation, determined by a careful examination, is diagnostic. The external auditory meatus is mopped out. (If there is difficulty in getting a clear view by this method, a little gentle syringing will do no harm.) After the drum has been cleansed, the perforation is seen anteriorly, and generally in the lower part. It varies in size from a pin's head to a perforation involving half the drum. When the perforation has been clearly defined the patient is made to inflate the Eustachian tube by holding the nose, closing the mouth, and blowing down. This will blow up bubbles of muco-pus from the tube into the middle ear, and these will pass through the perforation, giving clear evidence of the source of the discharge. The duration of the attack varies considerably. If the child is otherwise healthy and in good condition the discharge may dry up entirely in a few days. The perforation heals over quickly, and

* Delivered to the Croydon Division of the British Medical Association on December 15th, 1931.

often so perfectly that even on close examination the resultant scar will be missed. On the other hand, if the child is weak, debilitated, and living in poor surroundings, the discharge will drag on a weary course for weeks or months before it finally ceases. In either case it is only a question of time until the child gets the next cold, and infection is once more carried up the Eustachian tubes.

So here there is a very clear clinical picture—a recurrent discharging ear, starting with a cold or sore throat, followed by pain in the ear, then by discharge, and running a course of a few days or a few weeks. The discharge then dries up, and the drum heals over—all ready for the next cold and the next attack of earache.

Treatment

Local treatment consists in keeping the ear clean, the discharge being wiped out at frequent intervals, either by mopping or by gentle syringing. The inflamed mucous membrane is soothed by the application of glycerin acid carbolic drops, and care is taken that the presence of discharge in the meatus does not lead to an eczematous infection of the skin round the concha. The original focus of infection in the nose or throat must be dealt with, and tonsils and adenoids, if infected, must be removed. Infected nasal sinuses should be opened and drained, for, without this, recurrence of the discharge is almost inevitable.

MASTOID ANTRUM AND AIR CELLS

When the cause of a chronic discharging ear lies in this region the history is one of a persistent middle-ear discharge, which runs on for weeks or for months, until there comes a time when, for some reason or other, blockage occurs. The pus which is escaping from the mastoid antrum and air cells has to reach the middle ear by flowing through the narrow aditus. It is here that the blockage takes place. When drainage has stopped the patient complains of pain in the ear, and often of an aching, deep-seated pain behind the ear. On examination, pressure over the antrum and the mastoid process elicits tenderness. Again, the pain lasts a variable time —a few hours or a day or two—and is relieved by the re-establishment of drainage. The dam formed in the aditus gives way, there is a free flow of pus from the middle ear, the temperature subsides, and the acute attack is over. The mastoid antrum has no mucus-secreting glands. The discharge, then, from this type of case is purulent, and has not the stringy, sticky, mucous character of the Eustachian infection. Examination of the ear completes the diagnosis. As might be expected, the perforation is situated on the opposite pole of the drum from the perforation of a recurrent Eustachian infection. In other words, it is a posterior perforation, involving mostly the upper half of the drum. The ear must be mopped free of all discharge, and the existence of pus in the antrum determined by means of a suction speculum. This is inserted into the ear, and suction is applied by means of an attached rubber tube: through the lens the pus can be observed slowly trickling down from the region of the aditus, coming from the antral reservoir, and welling into the external meatus.

Treatment

I am not going to say any more about local measures, which are essentially the same as I have already detailed. The correct treatment is an operation which drains the mastoid antrum and its attached air cells—such an operation is a simple cortical mastoid through an incision over the mastoid process. The outer layer of the bone is removed, the mastoid antrum opened up, and the whole of the mastoid area searched for all infected cells. The mastoid process is drained through the original wound while the whole of the middle ear is left intact. If drainage is thorough and complete, discharge from the ear dries up quickly, and the posterior wound is gradually allowed to close.

INFECTION OF THE ATTIC

The third type of case, in which the disease is confined principally to the region of the attic, is much rarer than either of the two preceding ones. It is more chronic, and is difficult to treat by conservative measures. There is a history of continuous aural discharge for years, without cessation of any kind at all and without such incidents as pain or acute attacks. The discharge is usually thin and watery in character, and is associated with exfoliation and an eczematous condition of the meatus and concha.

Examination of the drum shows a typical perforation. The whole of the true drum is intact, but through Shrapnell's membrane there is a small pin-head perforation which leads down through a fistulous track to the region of the attic. Occasionally this perforation is enlarged to include part of the bony outer attic wall, and in this case there is usually a small amount of cholesteatomatous debris to be seen lying within the attic. One other variation is fairly common—the presence of a sentinel polypus growing from the eroded edge of the perforation through the bony attic wall. The polypus is usually small, friable, and very easily removed. In spite of the long duration of the discharge, the patient's hearing in that ear is still very good—a whisper may often be heard at a distance of several feet. This type of suppuration is also frequently associated with the sclerotic type of mastoid, in which the antrum is small and there are no adjoining air cells.

Treatment

It is obvious that substances introduced through the meatus in the ordinary way have little or no chance of penetrating to the tiny fistulous perforation. They merely lie on the surface of the intact drum and are useful only for cleansing purposes. The problem is how to lay open this fistulous track to obtain healing, without, at the same time, doing damage to the intact drum, with the consequent diminution of hearing in that ear. The best method of attack is by operation, and for this purpose the epi-tympano-mastoid operation has been devised. This consists in opening up the mastoid antrum in exactly the same way as for the ordinary cortical mastoid operation. The cartilaginous meatus is pushed forward to expose the tympanic membrane and the outer attic wall. The bridge which roofs the aditus is broken down, and the bony outer attic wall is slowly and carefully chiselled away: the ligaments supporting the hammer and the tympanic membrane must be left intact. Shrapnell's membrane and the bony outer attic wall are removed, so that the whole of the region of the attic is laid open. The cholesteatomatous debris is syringed out from the attic, the posterior wound is completely closed, and the cavity is drained into the meatus. This operation requires care in the performance. The results are good in the majority of cases: the opening which has been made into the attic cicatrizes over, the discharge dries up, and the hearing—which is the important thing after all—remains practically the same as before the operation.

The Sentinel Polypus

Not all polypi are safe to remove, but this one, growing as it does from the outer attic wall, is away from all danger points, and can be taken away with impunity. It is soft and friable, and has a very narrow base of attachment, which can be easily broken through by

pressure with a probe covered with cotton-wool—a practically painless procedure, which can be carried out in children under a local anaesthetic. After the polypus has been removed the stump of attachment should be touched with a drop of 50 per cent. silver nitrate. The simple treatment of the polypus in this manner, in children at any rate, usually leads to an immediate drying up of the discharge, and I have therefore come to look upon the presence of polypus (in these cases only) as a favourable prognostic sign.

DISEASE OF THE TYMPANUM

In the fourth type of case the disease is limited to the middle ear or tympanum itself. There is frequently a history of an ear which has been the site of a recurrent Eustachian infection, the source of which has been cleared up; but discharge continues from the swollen, infected mucous membrane of the tympanum. It has no bad odour, but annoys by its persistence. Examination of the ear shows a central perforation of the drum—that is to say, it involves the membranous part of the drum only, and does not encroach on the bony tympanic ring at any point. I do not mean that the perforation is small: it may involve a very large part of the drum. The mucous membrane of the inner wall of the middle ear can be seen through the perforation, and is usually oedematous, juicy, and succulent. Care over a long period (drops and keeping the ear clean) usually leads to a cure. It is, however, extremely difficult to teach the patient to keep his ear clean, and economic considerations prevent daily visits to a doctor.

Treatment

It is in this type of case that we have in ionization a most powerful ally. Ionizing an ear is a process which is easily performed. The ear is first of all scrupulously cleaned by syringing or mopping and by sucking away the last vestige of discharge from the middle ear by means of a suction speculum. The middle ear and external meatus is then filled to the top with a zinc sulphate solution. Into this pool is introduced a vulcanite speculum, down the centre of which runs a metal electrode. The electrode is attached to a positive pole, the negative pole being attached to a flat electrode applied to an arm or leg. A current of from two to three milliamperes is passed for ten to fifteen minutes. The whole process is completely painless, and can be carried out in very young children without the slightest trouble. Care is required in working up the strength of the current slowly to the maximum to be used, and similarly at the end of the time in decreasing the current equally slowly. Any quick alteration in the strength of the current will produce giddiness and sickness, due to stimulation of the semicircular canals. When it occurs, it is best dealt with by making the patient lie flat and quiet. It passes off in about a quarter of an hour. For this reason ionization should never be tried in a case in which there is a well-marked history of giddiness, as there may be an erosion present involving the wall of the inner ear and rendering the patient particularly susceptible to such attacks. I have also found it is not without risk to ionize an ear in which there are any acute inflammatory signs, as I think they have become more marked after treatment. With these exceptions ionizing is without risk, and when it is applied to the special type of case which I have described the results are excellent. With one or two applications the discharge dries up entirely. It has the great advantage of taking the treatment out of the hands of the patient and his home, where it is usually very inefficiently carried out, for after ionizing no treatment at all is required until the ear is inspected again at the end of two or three days.

MASSIVE INFECTION OF MIDDLE-EAR CLEFT

There is usually a history of a profuse purulent discharge, continuous, often blood-stained, and almost always foul-smelling. Acute attacks are common throughout the disease, bringing with them pain and headache, associated with slight rise of temperature and tenderness over the mastoid. This is a type of ear in which we have to beware of extensions to the inner ear and the intracranial structures. Examination in such a case usually shows gross destruction of the drum, with only the remains of a hammer handle adherent to the inner wall of the middle ear and surrounded by granulations or polypi. The bony tympanic ring, and even the bony wall of the external meatus, are frequently eroded, and the presence of white, foul-smelling flakes of cholesteatomata is common.

Treatment

The great problem is how to treat the condition so as to dry up the discharge completely. This, it should be said at once, is impossible in a certain proportion of cases. It is quite obvious, surely, that for an operation to have any chance of success it must clear out the chronically infected mastoid process, and also deal with the middle ear and the disintegrated ossicles—in other words, a radical mastoid, which lays open the tympanum, the attic, and the mastoid antrum into one cavity, and removes the remnants of the drum and the disintegrated ossicles.

There would be a perfectly clear-cut indication for operation but for one or two stumbling-blocks. The first is the all-important question of hearing. It is amazing how much destruction of the drum and middle ear can be present with the retention of a very acute degree of hearing. As a rule, it may be stated that the performance of a radical mastoid will lessen the power of hearing in a case in which this is good. And, further, even in the hands of the most expert operator, there is not anything like 100 per cent. cures following a radical mastoid. In a large proportion of cases (I should put it at from 20 to 30 per cent.) a certain amount of discharge persists after the most carefully performed operation. This is due to a variety of factors, the chief among them being the difficulty and danger of too thorough removal of disease in the middle ear itself, the danger of exposing and injuring the facial nerve or of carrying infection to the inner ear, and the difficulty in obtaining closure of the Eustachian tube. So here we have the problem of a chronically discharging ear in which a most carefully planned and executed operation can promise a complete cure only in 70 per cent. of cases, and in which there is also a certain loss of hearing following the operation.

Clear indications for operation are: (1) evidence of impending involvement of the inner ear, given by attacks of giddiness or the presence of a fistula; (2) symptoms of intracranial involvement, such as persistent and severe headaches; (3) frequent recurrence of acute exacerbations with temperature and attacks of pain; (4) signs of involvement of the facial nerve; and (5) evidence of a progressive bony necrosis, as shown by the rapid and frequent recurrence of granulations and polypi following removal. When any of these indications are present, a radical mastoid has to be performed.

CONCLUSION

Finally, I should like to add a word about preventive treatment. It is, I am sure, by preventive treatment that the problem is ultimately going to be solved. In most cases of chronic middle-ear suppuration there are two factors which stand out clearly. The first is that the most persistent forms of chronic discharge are directly traceable to the infectious fevers of childhood—measles,

scarlet fever, and diphtheria. Is it too much to hope that immunizing methods on the lines already introduced in the case of scarlet fever and diphtheria will eventually abolish these diseases, and at one stroke remove a large percentage of the worst type of discharging ear? The second factor is this: Chronic discharge of the middle ear is a disease of the poorer classes. It is a disease which is fostered by poor feeding and bad housing. Many an ear which has failed to respond to all methods of treatment has dried up entirely when the unfortunate child is removed from his own surroundings and sent to a convalescent home in the country or seaside for three to six months. Unfortunately economic conditions prevent the parent from keeping him in decent surroundings, and when the child returns home it is only a question of a few weeks before the discharge recurs.

THE SIGNIFICANCE OF URINARY "PROTEOSE" IN IDIOPATHIC EPILEPSY

BY

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LIEUT. R.A.M.C.(S.R.)

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Of recent years idiopathic epilepsy has come less and less to be looked upon as a disease of the brain and has become to be considered a symptom-complex with cerebral and nervous manifestations. With this changed outlook it is natural that various theories of extracranial causation should have been more or less completely investigated.

AETIOLOGY

The most widely accepted hypothesis of the causation of epileptic fits is that which postulates the presence of some convulsant toxin in the circulating blood. Much experimental work has been done to demonstrate the plausibility of this, and fits closely resembling, if not identical with, those found in clinical epilepsy have been produced by the administration of various toxic substances. Magnan,[1] one of the earliest workers in this line of approach, produced fits, both in human beings and in dogs, by oral administration and intravenous injections of absinthe, while Rhoeber[2] and others produced similar results with picrotoxin. Purkinje succeeded in obtaining epileptiform fits in himself by taking appropriate doses of camphor, and Muskens[3] and others have carried out extensive experiments on the fits produced by camphor monobromide.

The conclusion reached by all the observers was that the fit was a direct response to the presence of the particular poison in the circulating blood. It was a normal physiological response, the result being to "discharge" the animal for the time being—probably by breaking down the toxic material to some innocuous substance. Thus Wiedemann[4] found that when recovery took place from the epileptiform fits produced by camphor, all the camphor was excreted in the harmless form of uramidocamphoglycuronic acid and camphoglycuronic acid, and he considered that the fits themselves had caused this breakdown.

All this work, though of considerable value from the point of view of pure science, in the demonstration of the exact nature of myoclonic reflexes threw no light on the actual causation of true epilepsy.

Periodically observers (particularly Pagniez, Mouzon, and Turpin[7]) have reported that they have withdrawn the blood from epileptics during fits and have injected this into normal people, producing in them convulsions. This seems to support the hypothesis of a circulating convulsant, but Goodall[5] and others, working at the Cardiff City Mental Hospital, report that they have been unable to demonstrate the toxicity of either the blood or cerebrospinal fluid in epilepsy or in psychotic conditions. On the other hand, Loewe[6] has stated that he has been able to extract from the urine of epileptics an insoluble adialysate which, when injected intravenously, was capable of producing convulsions identical with those of epilepsy, though an adialysate similarly prepared from the urine of normal people proved non-toxic.

To explain the periodicity of epileptic fits and the production of an endogenous convulsant poison various views have been brought forward, and many observers consider that the disease should be grouped with migraine and asthma as an allergic manifestation. In 1924 Collier[8] suggested that epilepsy was probably a metabolic dyscrasia, and cited reports of good results obtained by removing the blood from epileptics and attempting to desensitize the patients to their own serum—presumably on the assumption that it contained some fit-producing material (see above). On the other hand Worster-Drought[9] reported that, working on the idea of the supposed relationship between epilepsy and asthma, he had carried out a series of cutaneous reactions for protein sensitization with common food extracts on forty cases of idiopathic epilepsy, and had failed to obtain a single positive reaction.

ACCOUNT OF INVESTIGATION

In view of these conflicting results it was decided to carry out certain tests on the epileptics in this hospital.

Favourable results having been reported in the district on the treatment of cases of asthma and migraine by injection of "urinary proteose" as recommended by Oriel and Barber,[10 11] it was decided as a preliminary to examine the urine of epileptics for the presence of these substances. Sixty-eight unselected cases were taken and all treatment temporarily stopped. The urine was tested, and in forty-eight cases (71 per cent.) "proteose" was found to be present; in 47 per cent. of these it was found to be present in considerable amounts. It was decided that no useful purpose would be served at this stage in attempting to estimate the amount quantitatively. Urine specimens were next taken and actual specimens of the "proteose" extracted by the method recommended by Oriel.[12] The so-called "proteose" we found to be a greyish-white powder, insoluble in water or ethyl alcohol, but readily soluble in ether. Fresh specimens, it was found, dissolved rapidly in decinormal sodium hydroxide, though specimens that had been kept for two or three days dissolved less easily, probably indicating that they had undergone some chemical or physical change. Solutions were made in decinormal sodium hydroxide and subjected to various chemical tests. Consistently negative results were obtained with Millon's test, the biuret and xanthoproteic reactions, to which positive results were reported in all cases by Barber and Oriel in the urinary "proteose" of asthmatics.[11]

Ten epileptics were next taken and, all treatment having been stopped, urine specimens were collected and extracted, the resulting "proteose" being made up into sterile solutions at dilutions of 1 in 10, 1 in 100, and 1 in 1,000. Into the anterior aspect of the forearm of each case 0.1 c.cm. of a 1 in 1,000 solution of the patient's own "proteose" was injected intradermally; while into the other arm a corresponding volume of similarly diluted caustic soda was injected as a control. The arms were examined every ten minutes for an hour, and then at half-hourly intervals for four hours. In all cases a slight area of erythema rapidly developed round the site of inoculation, but in no case was any characteristic wheal produced indicating hypersensitivity towards the injected material, and in no case was the erythema more marked in the

"proteose"-injected arm than in the control arm. The only interesting fact that emerged was that one of the injected patients developed a severe urticarial rash the next day, which, it was considered at the time, might be due to a sensitivity towards the injected "proteose."

A week later the same ten cases were taken and again injected, this time with a different "proteose." Five were injected intradermally with 0.1 c.cm. of a 1 in 1,000 solution of a "proteose" obtained from another epileptic, two were injected with a similar volume of a "proteose" obtained from the urine of an asthmatic, and three with a "proteose" from a case of migraine, the last solutions being kindly supplied by Dr. E. N. Davey, the pathologist to the Gloucestershire Royal Infirmary. At the same time three normal healthy persons were injected with a similar amount of epileptic "proteose." Again no reaction was produced in any of those injected.

At the end of another week a further series of injections were given, using a 1 in 100 solution, but with these again no reaction indicating sensitivity was produced.

Attempts at Desensitization

The above results were considered to have proved that cases of epilepsy possess no skin sensitiveness to "proteoses" from their own urine or from the urine of asthmatic or other related diseases, but it was considered that it might be feasible to suppose that the "proteose" in the urine might be a specific cerebral irritant, and might even be identical with the adialysate described by Loewe[6] or the toxin present in the blood mentioned by Pagniez and others.[7] Working on this hypothesis it was decided to attempt to desensitize certain patients to "proteose."

Ten cases were again taken. Seven of these were treated with their own "proteose," two with "proteose" from other epileptics, and one with "proteose" from an asthmatic. In all the cases subcutaneous injections were given at weekly intervals, starting with 0.1 c.cm. of a 1 in 100 solution, the dose being doubled every week till, finally, 3.2 c.cm. were given. The following results were obtained. The two cases injected with other epileptics' "proteose" were unchanged and the patient injected with asthmatic "proteose" was unchanged. Of the seven cases injected with their own "proteose" four showed absolutely no change in the number or force of the fits, or in their general mentality. At the end of the course of injections one patient who regularly had fits nearly every week went for three weeks with no fits, and for the time being showed an improvement in mental outlook. She has since relapsed, and has become worse than before. One patient who was previously having strong major fits, almost daily, has since had mostly minor fits, though the frequency has been unchanged and the typical epileptic mentality persists. The last patient, who always has a bout of four or five fits once a month followed by a week of marked mental confusion, went for two months with no fits, and although the fits have now returned, she is mentally almost normal and her fits are not followed by the semi-stuperose state.

DISCUSSION

These results, though taken from far too small a number of cases to be conclusive, point to the fact that the "proteose" of the urine of epileptics is not of great fit-producing significance, and that it is unlikely to be the same substance as Loewe's adialysate.

Certain facts which we elicited, however, tend to point the other way, and might be looked upon as showing that the urinary "proteose" is of importance either as a convulsant toxin or is in some way related to the production of fits. Thus it was found in those patients whose fits are controlled by luminal (phenyl barbitone) treatment, the "proteose" tends to vanish from the urine, but when the luminal is stopped and the fits return the "proteose" appears again in the urine. But in those cases where no benefit was derived from luminal administration it was found that the drug had no influence on the amount of "proteose" excreted. Another point of interest which came to light was that when an epileptic has a bout of fits, the urine is loaded with "proteose" at the commencement, but specimens withdrawn at intervals contain decreasing amounts, so that finally, at the end of the bout, when the fits stop, no "proteose" is discovered. This seems to fit in with the theory of Muskens and others that the fits "discharge" the subject by causing the body to destroy the circulating convulsant toxin, which, from the last observations, might well be the "proteose" or its precursor.

It is obvious from these contradictory results that no definite conclusion can be drawn, and it is yet to be proved or disproved that urinary "proteoses" are of significance in this type of case. It would probably be better, particularly as considerable doubt has of late been thrown on the specificity of "proteose" in other definitely allergic conditions,[13] [14] to await further reports from the Asthma Research Council before continuing work on these lines.

I must thank Dr. F. C. Logan, medical superintendent of the Gloucestershire County Mental Hospitals, for permission to publish these results, Dr. E. N. Davey, pathologist to the Gloucester Royal Infirmary, for valuable assistance and advice, and Mr. J. R. Stanbrook for technical assistance.

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TREATMENT OF MALIGNANT DISEASE BY PITUITRIN AND THEELIN

BY

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Susman (*British Medical Journal*, October 31st, 1931) claimed a certain amount of success in the treatment of malignant disease by the administration of pituitrin and the ovarian hormone oestrin (theelin), combined with a diet low in carbohydrate. It was of interest to discover whether these results could be verified by independent workers. A few cases have been so treated in the Royal Infirmary, Glasgow.

Cases were chosen in which no doubt existed as to the diagnosis. The tumours were submitted to microscopical examination, and this was repeated at intervals in several of the cases. During the treatment the patients were put on a diet low in carbohydrate and the twenty-four-hourly excretion of urine was charted.

CASE REPORTS

Case 1.—Squamous-celled carcinoma of the anal margin. Male, aged 56. There had been haemorrhage and swelling around the anus for some ten months. On admission, two large malignant polypi were found protruding from the anus, with induration and ulceration around the anal canal.

During treatment the patient experienced no pain in the tumour following the injections. The temperature remained normal throughout and the excretion of urine gave rise to no worry. Towards the end of the second week the induration became more marked, and a small quantity of pus localized itself at the posterior border of the anal

Period	Dosage Given	
	Pituitrin	Oestrin (theelin)
1st week	1 c.cm. three times daily	0.5 c.cm. daily
2nd ,, ...	1 ,, four ,, ,,	0.5 ,, ,,
3rd ,, ...	1 ,, ,, ,, ,,	0.5 ,, ,,
4th ,, ...	1 ,, five ,, ,,	0.5 ,, ,,
5th ,, ...	1 ,, ,, ,, ,,	0.5 ,, ,,

margin. At the end of this treatment the malignant condition was similar to what it had previously been. There was no decrease in size of the polypi and there was no suggestion of separation of the growth. Section of the tumour showed a still actively growing edge with no evidence of any destruction of the malignant cells.

Case 2.—Squamous-celled carcinoma of the anal canal. Male, aged 53, was admitted with a history of piles of some months' duration. On examination, an indurated ulcerated area could be felt within the external sphincter on the anterior wall of the anal canal. This ulceration extended upwards for fully one inch. There had been considerable pain in the rectum more or less continuous for a few weeks previous to admission. The Wassermann reaction was negative, and microscopical examination of the ulcerated edge showed the growth to be of the above type. Operative treatment was refused by the patient prior to this treatment.

Period	Dosage Given	
	Pituitrin	Oestrin
1st week	1 c.cm. three times daily	0.5 c.cm. daily
2nd ,, ...	1 ,, ,, ,, ,,	0.5 ,, ,,
3rd ,, ...	1 ,, four ,, ,,	0.5 ,, ,,

This latter dosage was continued for another four weeks. The temperature remained normal throughout and the urinary output did not fall below 26 oz. in the twenty-four-hourly period. The rectal pain which the patient had experienced previous to admission disappeared during the course of the treatment. Towards the end of the third week there was a sudden attack of pain and discomfort following one of the injections. There was sickness and nausea, but no vomiting. The pain was confined to the right leg. This attack was only transient, and did not necessitate cessation of the injections. After this continuous seven weeks' treatment the patient consented to operation. When removed the tumour was submitted to microscopical examination. The growth still showed activity, and there was no suggestion of any destructive factor acting on the malignant cells.

Case 3.—Squamous-celled carcinoma of the right groin. Male, aged 73, admitted with a fungating ulcerating area involving the right side of the scrotum, adjacent thigh, and base of the penis. The patient was a labourer in a pitch-preparing plant. The Wassermann reaction was negative.

Period	Dosage Given	
	Pituitrin	Theelin
First 3 days	1 c.cm. three times daily	0.5 c.cm. daily
3rd-6th day	2 ,, ,, ,, ,,	0.5 ,, ,,
6th-8th ,, ...	2½ ,, ,, ,, ,,	1.0 ,, ,,
8th-27th ,, ...	3 ,, ,, ,, ,,	2.0 ,, ,,

The dosage of pituitrin and theelin in this case was somewhat increased.

At this stage he was given a fortnight's rest. For the following six weeks thereafter he was given 2 c.cm. of pituitrin and 1 c.cm. of theelin each three times daily. The interruption of the treatment was due to the general disturbance in the patient. At no time during the course of the injections did the quantity of urine fall below 20 oz. in the twenty-four-hourly period. After most of the injections the patient experienced considerable pain in the area of tumour growth and radiating therefrom. This pain was never of such severity as to require sedatives. At the end of the second week the purulent discharge had ceased, and the ulcerated area appeared more healthy. The oedema of the penis remained stationary. Section of the growing edge of the tumour at this stage showed no regressive changes. The discharge reappeared later, and at the end of treatment there was no improvement in the malignant condition.

Case 4.—Generalized abdominal carcinomatosis. Female, aged 49, admitted with a history of six months' swelling of the abdomen. This swelling had passed off at intervals. There had been a feeling of sickness, but no vomiting. There was tenderness in both iliac fossae and a tumour was palpable in the right side. There was some free fluid present in the abdominal cavity. On abdominal exploration both ovaries were found enlarged and indurated. The omentum was extensively infiltrated, suggesting malignancy. A snipping of omental tissue was removed for section. This showed invasion by adenocarcinoma. This patient was put on 0.5 c.cm. of pituitrin three times daily and 0.5 c.cm. of theelin once daily. Increase in the pituitrin was not tolerated by the patient. This dosage has been continued for the last four and a half months, and at present the abdominal tumours are still increasing in size and repeated abdominal tappings are necessary.

This treatment has also been carried out in other cases over a shorter interval—namely, carcinoma of the ary-epiglottic folds, carcinoma of the female breast, and inoperable carcinoma of the pelvic colon. In the latter case treatment could not be prolonged owing to the stimulation of the bowel movement by the pituitrin, colostomy having been previously performed.

COMMENTS

In none of the cases treated could any improvement in the malignant condition be attributed to this treatment. In Case 2 the pre-admission pain was definitely alleviated—this was probably due to the daily bowel evacuation of routine hospital practice. In Case 3 it was thought that there was going to be some definite response, but no change ultimately took place.

The pain which follows the administration of pituitrin, at first localized to the area of tumour growth and then radiating therefrom, aroused some interest. If such pain were present constantly and only in malignant conditions it would prove of definite value in the pre-microscopical diagnosis of malignancy. Unfortunately it is not constantly present in the same case after each injection, and it is entirely absent in other cases of obvious malignancy. It is much too variable a factor to be of any definite diagnostic value.

In no case treated by this method has there been observed evidence of regressive changes in the tumour growth. All the cases have apparently followed the usual course of such disease. Similar findings have been recorded at the Middlesex Hospital by Riches and Kremer.[1]

This work has been carried out in the Pathology Department of the Royal Infirmary, Glasgow. I am much indebted to Professor J. S. Dunn for permission to carry it out, and for his interest throughout the investigation, and to Dr. I. M. Grant, superintendent, to Mr. J. A. C. Macewen, and to Mr. James Taylor for permission to treat and observe the cases under their care, and to Drs. Thorburn, Gibson, and Russell, and Sisters Hamilton and Forsyth, for their co-operation, and to Dr. J. S. White (Messrs. Parke, Davis & Co.) for a generous donation of pituitrin and theelin.

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PYLORIC STENOSIS OF CONGENITAL TYPE ASSOCIATED WITH TETANY IN A WOMAN OF 68

BY

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Hypertrophy of the pyloric sphincter is rare after infancy. Walton, in *The Surgical Dyspepsias*, mentions four reported cases and two of his own, in which "the pathological change was identical with that of congenital pyloric stenosis." His patients were aged 50 and 58; those in the reported cases were younger. He believes that the condition dates from infancy, when it is probably slight, but gives rise to obstruction in later life, when the gastric compensation fails. The association of tetany gives additional interest to the case now reported.

CASE RECORD

Mrs. G., aged 69 (1932), believes that she was a healthy, breast-fed infant, and that she had no infantile vomiting; she was one of a family of six, and was said to be "the best of the lot" as regards health. From the age of 15 she had periodical "sick headaches," which began with excessive salivation and ended with vomiting. They were apt to be precipitated by excitement, anxiety, or nervousness, as, for example, by the prospect of a dance or party. She married at 28, bore three healthy children, was never ill (though she considers that she has always been nervous), but remained subject to these "sick headaches."

In 1916 or 1917, when she was about 53, the "sick turns" became more severe, and after one period of vomiting lasting five or six days, "cramps" in the arms and legs came on, and were so painful that a doctor was sent for in the middle of the night. Similar attacks, followed by "cramps," occurred about once a year until, in April, 1924, she was seen by the writer. After four or five days of nausea, vomiting had begun, and continued unceasingly for five days, when, fearing the onset of "cramps," the patient sent for help late one evening. She looked thin, haggard, and dehydrated; the eyes were hollow, the cheeks sunk, the tongue coated with thick brown fur. Retching was incessant and distressing; the bowels had acted; the temperature was subnormal, the pulse rate 120 per minute, and the blood pressure 125/75 mm. Hg. The abdomen was retracted, and there was some rigidity and slight tenderness in the epigastric region just to the right of the umbilicus. The urine contained a heavy deposit of urates, but no albumin or sugar. After two days—that is, seven days from the onset of the vomiting—the patient began to recover. She felt hungry, was able to take quantities of fluid, and rapidly regained health and strength. No tetany occurred in this attack, which appeared to yield to the administration of opium and chloretone. She was advised to take parathyroid and calcium lactate, and did so fairly regularly.

The next attack occurred in February, 1925. After a week of retching and vomiting, "cramps" supervened, and she was seen in a typical spasm of tetany. The hands were in the accoucheur's position, with the adductors and long flexors of the thumb tightly concentrated; the Achilles tendons were taut, and the calf muscles hard. The patient was evidently in great pain, which was relieved by an injection of morphine and atropine. The general condition was the same as in the preceding attack, with the addition of a resonant swelling in the left hypochondrium corresponding to the position of the stomach. Glucose, parathyroid, and calcium lactate were administered; on the following day a second attack of tetany was checked by an injection of morphine and atropine, and on the third day (tenth from the onset) the patient began to recover.

Shortly after this she was admitted to the London Hospital, under Dr. Hutchison, for investigation. The Wassermann reaction was negative, the gastric acidity low, and the blood alkali normal. *X*-ray examination was equivocal, showing some anomaly of the duodenum, but no evidence of ulcer. Mr. Sherren considered that there was not enough evidence to justify exploration. The patient continued to take 5 grains of calcium and 1/20 of a grain of parathyroid three times a day, but vomiting, followed by mild tetany, occurred in August and September, 1925. In October, 1925, she had an atypical attack; vomiting was not excessive; tingling of the fingers and a gripping pain in the chest preceded the usual cramps in the hands and arms; the systolic blood pressure was barely 100 mm. Hg. A month later a general puffiness, thought to be a toxic oedema of unknown origin, was followed by the passage of large quantities of pale urine.

In March, July, and September, 1926, attacks of vomiting, with tetany of the hands only, occurred. In December, 1926, the patient began to take calcium and ammonium chloride (5 grains of each) three times a day, and thereafter had no tetany, though severe vomiting occurred in June, August, September, 1927, and June, 1928. After this the attacks became less severe until December, 1930, when the patient vomited continuously for eleven days, in spite of treatment (morphine, atropine, glucose saline) begun on the fifth day. Resistance in the right hypochondrium was noted on the seventh day; the urine contained large quantities of acetone, but no sugar or albumin; the blood calcium was 9.6 mg. per 100 c.cm., and no tetany supervened. The attack seemed to cease spontaneously, leaving the patient greatly exhausted and reduced in weight to 5 st. 10 lb. (normal weight about 7½ to 8 st.). She did not look "toxic," and began, as usual, to recover rapidly.

In February, 1931, she was again admitted to the London Hospital under Dr. Hutchison, who transferred her to Mr. Walton for laparotomy. He reported as follows: "There was very marked hypertrophy of the pyloric sphincter, with some distension and hypertrophy of the stomach behind, but no trace of any ulcer. I divided the pylorus longitudinally, and this revealed a good deal of hypertrophy of the muscles, with the general characters of a congenital pyloric stenosis, but of a milder degree." A wide pyloroplasty was performed.

It is now over a year since the operation, and the patient has made a perfect recovery. She is plump, and has a placid, comfortable appearance, instead of the thin, anxious look of former days. She weighs 8 st. 13 lb. She always considered that these severe attacks were, like her sick headaches in youth, brought on by "worry," but during the past year she has been extremely anxious about the health of her son and her granddaughter, and has had no gastric symptoms of any kind.

The chief points of interest in this case are: first, the condition of simple pyloric hypertrophy without previous ulceration in an elderly woman; secondly, the dramatic attacks of tetany; thirdly, the cessation of the tetany while the patient was taking calcium and ammonium chloride; lastly, the complete cure by pyloroplasty.

Memoranda

MEDICAL, SURGICAL, OBSTETRICAL

THE "GLOVE-BATH": A METHOD OF TREATING RHEUMATIC AND OTHER AFFECTIONS OF THE HANDS AND FEET

In the treatment of pain and stiffness associated with rheumatic and other conditions of the hands and feet, the application of heat by means of hot air, vapour, paraffin wax, mud, electric radiation, or diathermy is usually adopted. As practically all these measures require some kind of special apparatus, which is not always available, I find equally good results can be obtained by the following simple and easily applied method, which can be carried out wherever there is a supply of running hot water.

The hands, enclosed in rubber gloves—a few sizes too large—or the feet encased in rubber socks that reach halfway up the calf, are immersed in hot water maintained at a temperature of from 105° to 110° F. for twenty

minutes to half an hour, daily or alternate days as ordered. Ordinary surgical gloves are used, and Messrs. Allen and Hanburys supply a special rubber sock for the purpose. If considered necessary, an ointment of wintergreen, methyl salicylate, iodine, or menthol can be applied to the parts before putting on the gloves or socks. Owing to the retention of heat, and the raising of the local internal temperature, it will be found that on removing the coverings of the hands and feet the parts are bathed in a copious perspiration, and are much more supple. Massage can therefore be much more efficiently carried out, as all muscular spasm is relieved. The immersion in hot water of the hand or foot enclosed in a waterproof covering has the effect of a poultice, and therefore vastly different to that which follows their immersion without such protection.

Among the many indications for the use of what I call the "glove-bath" may be mentioned: arthritic changes with consequent stiffness, pain, swelling or deformities in the wrists, fingers, ankles, and feet; sprains and strains of the feet or wrists; stiffness following old injuries; fibrositis of the palmar or plantar fascia; in the manipulative treatment of flat-foot where muscular relaxation is required; in fact, in any condition in which pain and stiffness are prominent symptoms.

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TWO CASES OF BREECH PRESENTATION

In the *British Medical Journal* of January 2nd Mr. Ince of Queen Charlotte's Hospital reports, as a rarity, a case of a breech with extended legs which flexed before delivery. I wish to describe two similar cases which occurred recently at the Jewish Maternity Hospital.

CASE I

At the ante-natal clinic on August 31st, 1931, there was seen for the first time a multipara, aged 32, with four previous normal confinements, and expecting to be delivered on November 17th. From October 5th the case was diagnosed as an oblique presentation, with the back lying to the left, the breech in the right iliac fossa, and the head to the left of the fundus. From October 26th abdominal palpation suggested extended legs.

On November 2nd and 4th external version was attempted, but, owing to marked irregularity of the foetal heart when the head was brought to the mid-line, it was abandoned. On November 6th the *x*-ray department reported breech with extended legs and oblique lie. On November 11th version was again attempted, with the same result. It was decided to allow it to remain oblique and to keep the patient in hospital under observation. On November 15th induction by castor oil, hot bath, and enema was attempted with no result. On November 27th this was repeated, and slight pains began at 9 a.m. The foetal heart became slow (under 120) and irregular. Slight pains continued all day, and the heart varied between 100 and 144, soft and faint. November 28th, no pains; foetal heart still irregular. November 29th, no pains; foetal heart normal, regular rate.

On December 1st hypodermic injections of thymophysin, 1/4 c.cm. hourly for six doses, were given with no result. On the 3rd this was repeated with no result. Induction was abandoned. The patient was palpated daily, and each time extended legs were felt. Sometimes the presentation was longitudinal and sometimes oblique, but the heart remained good. On December 11th, at 3 a.m., slight pains began. The position was oblique, with the legs extended. The foetal heart was good. On December 12th, at 5 a.m., the membranes ruptured spontaneously. On vaginal examination cervix was half dilated and a foot was presenting. At 7 a.m., on examination of the abdomen, a mass was palpable in the right iliac fossa, and another could be ballotted in the left of the fundus. Under a general anaesthetic and in the dorsal position, a hand was introduced into the vagina and the cervix was found to be three-quarters dilated: the breech was lying in the right iliac fossa, with both legs flexed and crossed over each other, and the back was in front. The right iliac crest, the right knee, and the toes of the left foot were presenting. An attempt, by abdominal manipulation, to push the breech over the pelvic brim failed, therefore the right leg was brought down and the patient allowed to come round from the anaesthetic. The pains did not recommence until 1 p.m. At 2.30 p.m. the breech was born with the left leg flexed. Both arms came down spontaneously, and the head was delivered by the Smellie-Veit-Mauriceau method. A living male child, weighing 8 lb. 4 oz., was born.

CASE II

On October 10th, 1931, a primipara, aged 29, attended the ante-natal clinic for the first time. She was due, according to her dates, at the beginning of February. On November 13th a breech presentation was diagnosed. On November 27th version was unsuccessful. On December 16th version again was unsuccessful. The *x*-ray showed a breech with extended legs.

On January 1st, 1932, at 11 a.m., the patient was admitted to hospital because she was complaining of a "show," but was not suffering with "pains." External version was again attempted, but was unsuccessful. At 9.30 p.m. the membranes ruptured spontaneously, and on vaginal examination the cervix was found to be two fingers dilated with a heel presenting. Next day, at 10 a.m., the patient had not yet complained of labour pains. The cervix was still two fingers dilated and a heel presenting; in other words, no advance had been made during the night. At 10.30 a.m. labour was induced by the introduction into the uterus of a hydrostatic bag, and at noon pains began. At 7.30 p.m. the bag was expelled. On vaginal examination the cervix was found to be three-quarters dilated, and both legs were flexed and both feet presenting. At 8.30 p.m. the buttocks, with both knees flexed and the legs crossed, were born. The arms came down spontaneously, and the head was delivered by the Smellie-Veit-Mauriceau method. A live female child of 6 lb. 10 oz. was the result.

I wish to thank Mr. Leslie Williams and Mr. R. C. Brown for their permission to publish these cases.

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INFLUENZAL MENINGITIS

In Price's *Textbook on the Practice of Medicine* it is stated that influenzal meningitis is invariably fatal. I am able, however, to report a case of complete recovery.

A girl, aged 6, was admitted to the Christchurch Hospital with a few days' history of meningitis. The symptoms were classical enough, and a lumbar puncture was at once performed. This revealed turbid fluid, with a cell count of 24,649 per c.mm.; sugar, 0.065 gram per cent.; chlorides, 0.750 gram per cent.; and protein markedly increased. She was given 30 c.cm. anti-meningococcal serum, though no meningococci were seen. A lumbar puncture was performed daily and serum injected for three days, when it was reported that the fluid had grown influenzal bacilli in pure culture. The patient was still delirious, and there seemed no hope of recovery. The temperature was 103° F., and the pulse 140; there was vomiting. The sole treatment was repeated lumbar puncture, at first daily, then every two or three days, and then only for the relief of headache or on account of rise in temperature.

In a month the temperature dropped to normal, after which, despite several remissions, the girl made a steady improvement. Two months after admission the cell count was 64, and the fluid proved sterile for the first time—influenzal bacilli in pure culture had been grown from all previous specimens—and she was discharged completely recovered. Three months later she was still perfectly healthy, intelligent, bright, and gaining weight.

Melbourne. P. HAMILTON WOOD, M.B., B.S.

British Medical Association

CLINICAL AND SCIENTIFIC PROCEEDINGS

LANCASHIRE AND CHESHIRE BRANCH

Effect of Diet, Drinks, and Drugs on Renal Excretion

At the annual meeting of the Lancashire and Cheshire Branch held at Bolton on June 22nd, Dr. R. D. MOTHERSOLE delivered his presidential address, taking for his subject the effect of diet, drinks, and drugs on the renal excretion.

The President opened by maintaining that every practitioner would do well to specialize in one or other branch of the profession, and instanced the topic he had selected as having a very wide bearing. He acknowledged his debt to the late Dr. Alexander Haig, and added that, although it was the fashion nowadays to belittle his opinions about uric acid, the theory he had advanced formed a framework into which many apparently unconnected clinical phenomena fitted with absolute accuracy. Haig's theory was: (1) that urea and uric acid were formed in the body from the breaking up of proteins in the ratio of 35 of urea to 1 of uric acid; (2) that when uric acid did not exceed that ratio in the blood it caused no morbid or unpleasant effects; (3) that when uric acid was found in a higher proportion than 1 in 35 it was the result of the assimilation of purin bodies in food or drink, or of its release from the liver or other organs; and (4) that uric acid might give rise to disease, or some of the symptoms of disease, either when there was an excess of it passing through the blood, or when it had been precipitated into certain tissues or organs. Dr. Mothersole said that five main points had to be considered in regard to the normal renal secretion —namely, its quantity, its specific gravity, its urea and uric acid contents, and its reaction. Some of these factors varied in inverse ratio, and others in direct ratio. The quantity of urine depended mainly upon the amount of fluid intake and the amount leaving the body in other ways, chiefly by perspiration. The specific gravity was of less importance since it was possible for a healthy individual to pass two samples within twenty-four hours with two such different specific gravities as 1001 and 1030. In health the excretion of urea depended upon the amount of protein assimilated, while the excretion of uric acid in the urine depended mainly on the reaction of the fluid. Most individuals who lived on a mixed diet, and only took a moderate amount of exercise, had a fair amount of uric acid stored up in the liver and elsewhere. Any increase in the alkalinity of the blood brought some of this into solution, to be excreted by the kidneys. More uric acid was excreted during the alkaline tide of the morning hours than in the afternoon and the first part of the night. Knowledge of the reaction of a single specimen of urine was of very little value unless the circumstances under which it was passed were known. Dr. Mothersole suggested that the main source of urinary acidity was the hydrochloric acid secreted by the stomach in the process of digestion. Other sources might be: (1) the breaking up of proteins, (2) the result of muscular exertion, (3) the sequel of the oxidation which maintained the body heat, and (4) the ingestion of such acid fluids as beer and wine. Digestion undoubtedly increased the amount of acid in the urine, and the alkaline tide in the early morning hours appeared to be due to the length of time since the last meal. This tide in those who had accumulated uric acid accounted for their craving for an early morning cup of tea, and for the fact that most people were at their worst before breakfast. Cold increased the acid of the urine, heat reduced it; perspiration also caused a great reduction of acidity. The importance of urinary acidity lay in the fact that the excreted acid must have reached the urine by way of the blood, so that if the amount of acid was large the alkalinity of the blood would have been reduced, causing uric acid, which would otherwise have been excreted, to be stored up in various organs and tissues.

Foodstuffs were classified in three groups—namely, (1) those which contained a considerable amount of purin bodies, chiefly animal food and the pulses; (2) those which were practically free from purin bodies (white bread, milk and cheese); and (3) various vegetables. The first group introduced into the body uric acid equivalents, but the increased output of hydrochloric acid resulted in their deposition in the liver, so that the immediate effect on the urine was that it became more acid, but contained less uric acid. The foodstuffs of the second group caused less acidity and introduced no uric acid, but those of the third group increased the alkalinity of the blood and so might increase the uric acid in the urine. Three groups of beverages were distinguishable—namely, (1) acid drinks, such as wine, beer, and cider; (2) alkaloidal drinks, including tea, coffee, and cocoa; and (3) neutral drinks, such as water or barley-water. The first group increased the acidity of the urine; the second group also appeared to increase the acidity, but, although they introduced uric acid equivalents, they kept uric acid out of the urine. The third group had no effect on the acidity, but probably favoured the solubility of uric acid. The first and second groups owed their refreshing character to their power of eliminating uric acid from the blood. The groups of drugs principally concerned were: (1) metals and their salts; (2) acids; (3) alkalis; (4) salicylic compounds; (5) alkaloids; and (6) certain coal-tar derivatives, such as phenacetin and antipyrin. The first, second, fifth, and sixth groups tended to increase the acidity, and caused uric acid to be retained in the body. The third and fourth groups were solvents of uric acid and increased elimination—apart from ammonia and its compounds, which tended to increase acidity. Tonics acted mostly by stimulating the gastric secretion, or clearing uric acid out of the blood in some other way. While salicylic compounds were useful as solvents of uric acid, this effect was diminished by associating them with alkalis, or the induction of perspiration. Small doses of alkalis might cause collaemia, with various unpleasant symptoms, while larger doses dissolved the uric acid and relieved collaemia. Lithium, if taken by the mouth, formed a nearly insoluble triple phosphate with the phosphates of sodium and ammonium, and so lessened the elimination of uric acid.

Dr. Mothersole proceeded to apply these principles to the treatment of anaemia and gout, and showed how their therapeusis had changed during the last quarter of a century. He remarked that it was curious how prominent hydrochloric acid had been throughout the treatment of anaemia. Liver extract and ventriculin probably acted by increasing the formation of pyloric hormones which stimulated the gastric cells to secrete more acid. It was tempting to suggest that the primary cause of pernicious anaemia was deficient secretion in the stomach of hydrochloric acid. The deficiency brought about uricacidaemia, which still further impaired the gastric secretion, and set up a vicious circle. Dr. Mothersole believed that the amount of hydrochloric acid secreted by the stomach was important, not only in respect of gastric digestion, but also for the part it played in regulating the hydrogen-ion concentration of the blood and the retention of excretion of uric acid. Since studying Haig he had regarded gout as a voluntary disease, which anyone with a good digestion and plenty of money might have or avoid at his will by his mode of living. Most followers of Haig would agree that, so far as gout was concerned, there was less harm in a bottle of vintage port than in a cup of strong tea or coffee.

Dr. Mothersole concluded by considering the aetiology of "the morning after the night before." The good dinner was enjoyed owing to the healthy appetite, and the gastric hormones excited a free flow of hydrochloric acid, which, with the aid of the acid wines and the after-dinner coffee, cleared the uric acid out of the blood by driving it into the liver or spleen. The blood pressure was lowered, the circulation was free, but some indiscretion in food or drink might upset the long-suffering stomach, causing nausea and, perhaps, vomiting. The flow of hydrochloric acid ceased, the alkaline tide of the

early morning hours rose to an unusual height, and the blood was flooded with uric acid. The circulation was poor, owing to collaemia (capillary obstruction), the blood pressure rose, and there was headache with mental depression. It might appear strange, but the speaker believed it to be true that a few grains more of uric acid circulating in the blood might make all the difference between merriness and misery. Haig's observations deserved more serious consideration than they had yet received.

Reports of Societies

INFLUENCE OF AGE ON CHILDBIRTH

At a meeting of the Edinburgh Obstetrical Society held on June 8th, with the president, Dr. JAMES YOUNG, in the chair, Dr. MILLER read a communication on "The influence of age on the process of childbirth," based on a series of 174 cases of pregnancy and labour in girls of 17 years of age or less, and of eighty-eight cases in which the patient had passed the age of 40 at the time of her first confinement. The cases had been treated for the most part in the Edinburgh Royal Maternity Hospital. Each of these age groups was considered separately in regard to the course of pregnancy, the duration and complications of labour, the type of delivery, and the end-results to mother and child.

Of the 174 cases of pregnancy in young girls two were 13 years of age at the time of the confinement, eight were 14, eighteen were 15, forty-one were 16, and 105 were 17. In the majority of the patients pregnancy proceeded normally and without incident to full term. The minor disturbances of pregnancy were not encountered more frequently than usual. On the other hand, there was a high incidence of venereal disease and of albuminuric toxaemia. The speaker thought that the undue frequency of toxaemia should be attributed to the inevitable lack of supervision associated with illegitimate pregnancy rather than to the youth of the patients. Such complications of labour as contracted pelvis, malpresentation and malposition, and injury to the soft tissues were not more common than in older women, and the average duration of labour did not differ appreciably from that regarded as normal for a first labour. The proportion of spontaneous deliveries was 85 per cent., and in not more than eight cases in the total series of 174 patients was intervention required on account of disproportion. It appeared probable that the relatively freer mobility of the pelvic joints and the greater elasticity and resiliency of the soft tissues in the young patient adequately compensated for such potential disproportion as might cause obstruction in an older woman. There were two maternal deaths in this series. Both were cases of eclampsia, and in neither had the patient been seen by a doctor until after the onset of convulsions. Four of the infants were stillborn, and a further seven died within a fortnight of birth; the total stillbirth and neo-natal death rate was 6.5 per cent., compared with a mortality rate of 11.8 per cent. for all viable children born in the hospital over the five-year period 1927–31.

The high incidence of albuminuric toxaemia was a noteworthy feature in the series of elderly primiparae which was analysed, 10.7 per cent. of the patients suffering from this complication in spite of careful ante-natal supervision. There appeared also to be an increased tendency to fibroid tumours, malpresentation, and possibly to accidental haemorrhage. Contracted pelvis had not been found to occur more frequently than in younger women. In the majority of cases labour was not unduly prolonged and in many it was rapid and easy; on the other hand, the proportion of patients in whom labour did exceed the statutory eighteen hours was much greater than in younger women. The most frequent cause of delay was primary uterine inertia; it was natural, moreover, that the physical effort of labour should be borne less well by the patient over 40, and a tendency to undue fatigue in the second stage was noted in a large proportion of cases. Not more than 40 per cent. of all the patients delivered themselves spontaneously, delivery being effected by forceps in 38 per cent., by Caesarean section in 12 per cent., and by breech extraction in approximately 10 per cent. There was one maternal death in the series; the patient, who had had no ante-natal supervision, was admitted to hospital late in labour; the pelvis was contracted and the child presented as face. She died of post-partum shock some hours after craniotomy. Twenty-two of the infants were stillborn or died shortly after birth, giving the high mortality of 26 per cent., and one which was all the more regrettable in view of the improbability, in most cases, of further pregnancy. The findings in this series supported the view that pregnancy and labour in the elderly primipara were more commonly associated with difficulty and danger than in younger women. The higher incidence of albuminuric toxaemia and of such complications as fibroid tumours and malpresentation demanded specially careful ante-natal supervision and examination. In the absence of complications the management of labour should not be influenced by the patient's age, though in view of the tendency to uterine inertia, quinine should be exhibited for some days before the onset of labour. Hospitalization was desirable in all cases, and, while disagreeing with those who advocate routine Caesarean section in all primiparae over 40, the speaker thought it justifiable to extend the relative indications for this operation to cover such conditions as entailed a serious risk to the child with vaginal delivery.

Primary Ovarian Pregnancy

Professor R. W. JOHNSTONE, Dr. E. CHALMERS FAHMY, and Dr. R. J. KELLAR presented a communication on primary ovarian pregnancy, with a report of two cases. In the first case operation was undertaken on account of symptoms indicating an acute rupture of an ectopic pregnancy. Laparotomy revealed a ruptured ovarian pregnancy, a foetus of about six weeks' gestation being found in the pelvis. The tube on the corresponding side to the ruptured ovary was normal; serial sections of the ovary, which was removed, showed the presence of chorionic villi in the ovarian stroma. The corpus luteum was found in a different part of the ovary, apparently separate from the gestation sac. In all probability the condition was one of implantation on the surface of the ovary. Sections of the tube showed no evidence of pregnancy. In the second case operation was undertaken on account of a simple serous cyst of the left ovary. Laparotomy revealed not only a serous cyst on the left side, but a very early pregnancy in the right ovary. This had ruptured, and blood was present in the peritoneal cavity. The haemorrhagic area was excised from the ovary, which was left *in situ* with its healthy tube. Serial sections through the excised portion showed the presence of chorionic villi attached to an active corpus luteum. According to the patient's history the pregnancy was of about fifteen days' duration. In this instance the pregnancy had occurred in the mature follicle. In both instances microscopical examination revealed the presence of large epithelioid cells in the ovary. The origin of these was discussed, and the conclusion was reached that many of them, at least, were decidual-like cells derived from the cells of the ovarian stroma. The facts obtained from very detailed examination of the specimens proved beyond doubt that both cases were examples of primary ovarian pregnancy.

Reviews

PHYSIOLOGY OF THE NERVOUS SYSTEM

All those who teach physiology or neurology, and no doubt many who are occupied with original work in those subjects, have long felt the desirability of some sort of sequel to *The Integrative Action of the Nervous System*, which appeared in 1906. That that work represents a landmark in the history of the physiology, as distinct from the anatomy, of the nervous system would be freely admitted. As everyone knows, Sir Charles Sherrington has had, and still has, much active work in hand, representing the logical outcome of his former researches. We therefore greet with especial pleasure the appearance of a small but eminently valuable volume on *Reflex Activity of the Spinal Cord*,[1] by five collaborators, among whom is Sir CHARLES SHERRINGTON. The book stands out alone amid the swamp of contemporary books on this and related subjects. To say that it is delightful reading throughout would be, if not positively untrue, at least a doubtful compliment, for parts of it are certainly difficult, and the several authors vary much in style and lucidity; but all are interesting and most instructive.

The analysis of spinal reflexes, with all their fundamental implications as regards posture, the nature of inhibition, and many other aspects of the nature of nervous action in general, has advanced so far during the last few years that, apart from the relatively few engaged in similar investigations, most of those whose interests are more general have been quite unable to follow the publications of the Oxford workers of to-day, or to perceive more than vaguely what were their main objectives. They will now be able, at least for a time, to follow their work and to assess its significance in the general problem. The present book has the advantage over the *Integrative Action of the Nervous System* of being the result, not merely of a great deal of further work, but, even more important than this, of having been produced at a time which is in every sense ripe for its appearance. The present better understanding of the nature of the nervous impulse, of muscular contraction, of excitation, and of minute structure, gives such a book an increased value, and renders possible many conclusions which would hitherto have been merely tentative.

That the volume will have great clinical interest is beyond question; but the application of the principles it enunciates to the problems of the clinic will be no matter for the inexpert. There is probably little danger of this, however, because this subject differs from such subjects as endocrinology in being one wherein the dabbler would be easily detected and put in his proper place. In conclusion, it may be stated that the book has been ably edited and is well produced.

A TEXTBOOK OF ORTHOPAEDICS

In *Orthopaedic Surgery*[2] Mr. WALTER MERCER has produced a useful textbook of the subject. In the preface he discusses the propriety of a general surgeon writing on a special subject such as this, and justifies it by the claim that a good surgical specialist must first be a good general surgeon. There is much in this argument, but when pushed home it seems to lead to a negation of specialism. Fractures and other recent injuries are not included in the subject-matter, but joint disease is. The chapters on congenital deformities and on general affections of the skeleton are adequate and up to date. It is of interest to find Mr. Mercer approving of the Winnett-Ovis method of treating osteomyelitis. Admitting the drawbacks of offensive odour, he yet finds himself an advocate of its merits, not only in osteomyelitis, but also in the treatment of compound fractures. If some method of deodorization could be devised there would apparently be a great future for the method.

The inclusion of tumours of bone in the subject-matter of this book is evidence of the great difficulty of drawing a line between special and general surgery. Tuberculosis is the subject of three chapters, and here we find evidence of the modern operative surgeon's tendency to hasten cure by intervention, not, as fifty years ago, by attempting to remove the diseased tissue, but by obtaining physiological rest by means of fixation operations upon the bones, such as bone grafting. Low back pain receives its share of attention, but we find little or nothing about sacro-iliac subluxation, which has received so much attention from United States surgeons of late years, but is barely mentioned by such authorities as Jones and Lovett. In the chapter "Some complications of trauma," under the subheading of "Volkmann's ischaemic contracture," it is stated that "by the exercise of proper care in the early stages of elbow injuries, this condition should not arise." As it has been proved that the condition may arise without any want of proper care, we think it a pity that such an authoritative statement should be published, which might be quoted in support of vexatious legal proceedings.

If we were to attempt to define wherein this book shows the point of view of the general surgeon, we should draw attention to the relative lack of insistence on the value of manipulative proceedings, which have been repeatedly and more and more forced upon the notice of orthopaedic surgeons by the successes of bone-setters and other irregular practitioners. It would be easy, perhaps, to show that the number of such successes has been much exaggerated, but, even if so, they are too numerous.

VISION AND COLOUR VISION

Dr. R. A. HOUSTON of Glasgow has added to his contributions on colour vision a small volume, *Vision and Colour Vision*,[3] wherein he incorporates the original work he has done on the subject and developed "a new method of approach" which purports to combine the ideas of the two principal opposing theories of colour vision known under the names Young, Helmholtz, and Hering. He looks upon the subject essentially as a mathematical physicist, a valuable and necessary standpoint in the consideration of a subject whose greatest difficulty lies in its many-sidedness and the immense range of varied knowledge which its complete presentation demands; but one of the disadvantages of the book in the eyes of many of its potential readers will probably be the general impression it gives of an elementary textbook of physics rather than a discussion of a subject in which the physiological and the psychological are at least of equal interest and importance. Most interest, however, attaches to the theory of colour vision put forward by the author. It starts with the premise that the sensation of light is mathematically a function of three variables: with this most will agree. He then argues that, although sensation is a function of three variables, it cannot be the sum of three separate sensations of brightness, but that the assumption is

[1] *Reflex Activity of the Spinal Cord*. By R. S. Creed, D. Denny-Brown, J. C. Eccles, E. G. T. Liddell, and C. S. Sherrington. Oxford: Clarendon Press; London: H. Milford, Oxford University Press. 1932. (Pp. vi + 183; 71 figures. 10s. net.)

[2] *Orthopaedic Surgery*. By Walter Mercer, M.B., Ch.B., F.R.C.S. Ed., F.R.S.Ed. London: E. Arnold and Co. 1932. (Pp. xi + 695; 371 figures. 32s. 6d. net.)

[3] *Vision and Colour Vision*. By R. A. Houston, M.A., D.Sc. London and New York: Longmans, Green and Co. 1932. (Pp. vii + 238; 102 figures. 15s. net.)

justifiable that there exists one sensation of brightness and two sensations of colour, or one sensation of colour and one of saturation. He considers that anatomically there are two different kinds of visual paths: those with a synapse in the outer reticular layer of the retina, and those with a synapse in the inner reticular layer, each with a single synapse, the relaying cells being arranged in two layers so that the cones can be packed closely. He makes the further assumption that after the synapse each fibre transmits only two kinds of impulse—red-green fibres transmitting red and green, and blue-yellow fibres transmitting blue or yellow. The light process and the colour process are quite separate, one taking place in the layer of rods and cones and the other in the reticular layers.

All this is very fanciful. The traditional view that two synapses exist in the same retinal visual path is dismissed, since the distance traversed by the bipolar cells is so small that a separate neurone seems unnecessary to carry on the nerve impulse ; but, in the first place, this argument forgets the morphological identity of every sensory pathway in the body. These are all built and developed upon the same lines, the bipolar cells being homologous to posterior root ganglia and their short processes corresponding to the long pathway from the cutaneous receptor to the nuclei of Boll and Burdach in the medulla. The principle of morphological identity in the different sensory paths of the body may appear absurd from the point of view of physics, but it is full of biological meaning. In the second place, a second neurone in the visual path finds ample physiological justification in the exceedingly complex interactions between the activity of different retinal areas which has been demonstrated by recent work within the last few years. The literature of colour vision will remain sterile so long as fanciful hypotheses are unnecessarily multiplied which do not rest upon a firm basis of proved physiological facts, and whose function is to satisfy mathematical equations the accuracy of which is by no means certain.

PAGET'S DISEASE OF THE NIPPLE

The title Cancerous Dyskeratinizations[4] has been adopted by Dr. JEAN ROUSSET in his work on Paget's disease of the nipple and Bowen's disease. A characteristic and well-known feature of these diseases is the appearance of certain large clear cells irregularly distributed through the epithelial layer of the skin. In the disease affecting the nipple they are known as " Paget cells." Their outer coat is double-contoured and thought to consist of keratin ; they are accordingly regarded as the product of deranged keratinization, an interpretation first advanced by Darier. Rousset's book deals with every aspect of the two diseases, and is based on a considerable number of personal observations and a very complete study of the literature ; it is therefore a valuable contribution to our knowledge of the subject. It has, however, a special interest in connexion with the author's views on the site of origin of the diseases. He has made a special study of the normal anatomy of the nipple and of those areas of the skin in which the diseases most commonly arise, and he has discovered that certain of the sebaceous glands in those regions are characterized normally by the presence of cells possessing all the features of Paget cells. On the strength of this observation he considers it is justifiable to conclude that the appearance of these cells in cancerous and precancerous lesions may be taken as sufficient evidence that the latter have their origin in sebaceous glands. If this view is correct, it affords an explanation of the occurrence of Paget's disease in extramammary regions. The presence of isolated Paget cells in outlying parts of the lesion is not easy to understand, but apparently the author is of the opinion that these have wandered from their original position in the nipple. In addition to the problem of the site of origin of the lesions the author has discussed that of their primary nature—whether they should be looked upon as cancerous from the outset, or whether a precancerous stage precedes that of the actual cancer. He is unable to distinguish a precancerous stage, and regards the disease as cancerous from the first. The long duration of Paget's disease, sometimes extending to many years, has usually been taken as evidence of a precancerous stage, but, as the author points out, a slow progress is known to occur in certain other forms of cutaneous cancer, and, as recently suggested by Muir, the prolonged course may be explained by the infiltration of the growth remaining confined to the epithelial stratum of the skin in the earlier stages. The term " Pagetoid epithelioma " is coming into use in some parts of the Continent for a disease which, it is claimed, has affinities with Paget's and Bowen's diseases. The author points out that the disease which has received this unfortunate name is well known in this country as rodent ulcer or rodent carcinoma, and has little in common with the two maladies under discussion.

[4] *Les Dyskératinisations Epithéliomateuses.* Par J. Rousset. Préface du Professeur J. Nicolas. Paris: Masson et Cie. 1931. (Pp. 599 ; 108 figures, 3 plates. 60 fr.)

PROGRESS IN EVOLUTION

A thoughtful and interesting essay, by Mr. K. W. MONSARRAT of Liverpool, has been published under the title *Desire and Creation*.[5] This is an attempt to explain how it is that the process of evolution has always tended to be an advance from what we recognize as the lower to what we recognize as the higher. Fortuitous and multitudinous variations, or sudden unexplained mutations, through natural selection and other influences, may explain survival value in the struggle for life ; but what is it that has led to the production of higher and higher types of species as measured, not by power of maintenance and reproduction, but by the qualities of life? The question has never been satisfactorily answered, or answered at all, from the scientific standpoint, and we do not think that Mr. Monsarrat has succeeded where others have hitherto failed ; but his attempt is laudable and intriguing. The first point on which he insists—and the insistence is surely necessary to-day—is that every living being is a unity, a single entity, and that when we speak of body, mind, spirit, or of the various qualities and faculties of mind, we are dealing with the results of analysis merely and not with whole things.

> " The conception that a bit of man is ' material,' another bit ' physiological,' another ' psychical,' another ' spiritual,' is no longer tenable. If the unity of the living organism is a true fact, the only study which will ascertain the truth concerning its abilities is one that will propose to comprehend them all, attend to their relationships, and give an account of a whole."

The author's next point is that in this study of the living being as a whole it is behaviour rather than structure which is of importance for understanding and explanation. " Ability of directing energy " is the mark of life in an organism, the unique characteristic of all the living ; such direction to satisfy desire is both self-ward and other-ward, and the " desire to give," whether conscious or unconscious, is inherent in the constitution of all living things and is the essential element which has led to the progressive path that evolution has tended to take, and even, perhaps, in some sort, to the creation of life itself. As a philosophy this may serve ; as a

[5] *Desire and Creation.* By K. W. Monsarrat. Liverpool: H. Young and Sons, Ltd. 1932. (Pp. 104. 5s. net.)

scientific explanation it is scarcely satisfying. It clearly involves the Lamarckian hypothesis and the almost constant inheritance of acquired behaviour and resulting characters. It is distinctly and avowedly anthropomorphic, working backwards from what is admittedly true of individual and communal human life to the ascription of similar qualities, even if in a more and more attenuated form, to the hedgehog, the oyster, the daisy, and the fern. In any case the way in which the author has formulated and expounded his propositions, and the many suggestive ideas which he has incidentally set out, make his essay worthy of careful attention.

NOTES ON BOOKS

In his book named *The Heart and Spleen in Health and Disease*,[6] Dr. ARBOUR STEPHENS travels over a wide area, and includes many topics other than those directly suggested by his title. Thus at the outset he discusses the cancer problem, in so far at least as to suggest that cancer "is due to a lack of oxygen on the part of the cells," while his second proposition is that throughout the animal kingdom there exists a "virus" which, varying in the size of its "particles," is sufficient "to account for all the diseases known and imagined." Other general statements are that "predisposition" means an already disturbed basal exudation and is itself a state of disease; that various newly introduced foods "have interfered with our basal exudations," and may thus help to explain the variations in the form of disease during the last twenty-five years; that surrounding each individual is an "aura," which plays an important part in the relations between man and man, and man and beast; and that many manifestations of disease, including housemaid's knee and miners' nystagmus, are associated with a low calcium blood content due to unsuitable food. This last-mentioned proposition Dr. Stephens applies particularly to rheumatism, chorea, and heart disease occurring in children, and indeed he affirms that all children "who suffer from acute rheumatism and tubercular disease" are of the "acid class" as a result of deficiency in lime-bearing foods and a partiality for vinegar, pickles, and so on. Dr. Stephens has his individual views on the causes of the heart sounds, the right clinical method for the estimation of blood pressure, and the relation of the spleen to calcium metabolism. In the present book he repeats what he has advanced in various papers in the medical press, but whether he will make many converts remains to be seen. He has been a diligent reader and thinker, but not everyone will agree that his thinking is sound. His line of reasoning is often difficult to follow and some of his statements smack of exaggeration. None the less there are good points in his book, and in some directions he gives reasons for doubting certain generally accepted opinions.

Psycho-Analysis for Normal People, by GERALDINE COSTER, is a useful little book with a misleading title, for the contents are far from exclusively Freudian in nature, as is admitted in the preface. The third edition has been improved by revision, and medical practitioners can confidently place it in the hands of thoughtful patients who wish to learn how self-adjustment to the demands of life can be promoted. In certain early stages of neurasthenia it would be far more effective than the bromides or tonics usually prescribed, though its trend is quite rightly prophylactic rather than therapeutic. It will be found useful by those concerned with the education of character in children, and will enable them to distinguish between the normal vagaries of growth and the beginnings of anti-social development which require medical rather than moral treatment.

[6] *The Heart and Spleen in Health and Disease.* By G. Arbour Stephens, M.D., B.S., B.Sc. London: H. K. Lewis and Co., Ltd. 1932. (Pp. xi + 139; 6 figures. 7s. 6d. net.)

[7] *Psycho-Analysis for Normal People.* By Geraldine Coster, B. Litt. Third edition. London: Milford, Oxford University Press. 1932. (Pp. ix + 227. 2s. 6d. net.)

There is no modern students' textbook on the invertebrates in English, and the volume entitled *The Invertebrata*[8] is an attempt to fill this gap. It is intended for students who have proceeded beyond their first year of zoological studies, and is concerned mainly with the classification of the groups of backboneless animals. Its interest to the average medical man is, on the whole, relatively small, while those chapters which deal with the animal parasites are too short and scrappy to be of much use, although they will probably serve in giving the zoological student some idea of the scope of parasitology. Even then, however, these chapters might have been more accurate, both in the text and in the drawings. The volume is copiously illustrated with line drawings, and there is an extensive index.

The book entitled *A Thousand Marriages*,[9] by Dr. L. R. DICKINSON and Miss LURA BEAM, deals with the gynaecological and psychical aspects of 1,098 women examined by Dr. Dickinson during his forty-seven years' practice, first as a general practitioner, and afterwards as a gynaecologist. The work is based on very full private histories, which include a description of the general health and circumstances and fertility of the wife and husband, as well as details relating to the sexual life of women at various stages of their married life, and of widows. Dr. HAVELOCK ELLIS, in his foreword, describes it as the first considerable medical analysis of marriage.

The Minutes of the General Medical Council and of its various committees for 1931 with fifteen appendices have been published in a volume of 438 pages; it includes the minutes of two sessions of the Council, of its Executive and Dental Committees, and of meetings of the English, Scottish, and Irish Branch Councils. The appendices comprise reports of the Finance Committee, the Colonial and Foreign Students Committee, the Dental Education and Examination Committee, the Education Committee, the Examination Committee, the Pharmacopoeia Committee, and the Public Health Committee, together with joint reports by the Education and Examination Committees on maternal mortality and morbidity, and on the place of preventive medicine in the medical curriculum. The *General Index to the Minutes of the Council and of the Executive and Dental Executive Committees* from 1903 to 1931 has also been published. It is a useful volume for reference, and occupies 244 pages. Both volumes are published for the General Medical Council by Messrs. Constable and Co., Ltd., price 5s. and 10s. respectively.

[8] *The Invertebrata.* By L. A. Borradaile and F. A. Potts, with chapters by L. E. S. Eastham and J. T. Saunders. London: Cambridge University Press. 1932. (Pp. xiv + 645; 458 figures. 25s. net.)

[9] *A Thousand Marriages: A Medical Study of Sex Adjustment.* By R. L. Dickinson and L. Beam. Foreword by Havelock Ellis. London: Williams and Norgate Ltd.; Baillière, Tindall and Cox. 1932. (Pp. xxv + 482. 21s. net.)

PREPARATIONS AND APPLIANCES

IODIZED MOOGROL

Iodized moogrol (Messrs. Burroughs Wellcome and Co.) is a new preparation for the treatment of leprosy. It is a mixture of the esters of the chaulmoogric series with 0.5 per cent. of iodine. At the Leonard Wood Memorial Conference on Leprosy, held in Manila in January, 1931, the use of iodized esters, particularly by the intradermal method, was strongly recommended. The intradermal or intracutaneous method has been employed by the Philippine workers for some years, and the advantages claimed are that it produces a more rapid resolution of the superficial lesions, and that it is relatively free from general and local reactions. About 0.1 c.cm. of the preparation is injected at each point in the lesion, and the total volume given at one time is not more than 5 c.cm.

"SCIATAGO"

"Sciatago" (Messrs. Coates and Cooper, Ltd.) is a combination prepared for the treatment of rheumatism and sciatica. The dragees contain phenyl-quinoline carboxylic acid (or cinchophen), hexamethylenetetramine (or hexamine), and glycocoll.

"A POSITIVE HEALTH POLICY"

SIR BASIL BLACKETT'S ADDRESS

In an address to the British Social Hygiene Council, at Livingstone Hall, London, on July 5th, Sir Basil Blackett made "a layman's plea for a positive health policy."

THE PRESENT POSITION

He asked whether we were getting value for our public expenditure on the social, and in particular on the health, services.

With taxation at its present level, failure to secure this in full became a serious matter. Expenditure on health services now amounted to over a hundred millions a year, and had increased between 1900–1 and 1927–8 from 14s. 5d. per head to £2 14s. 9d. Could we claim that the health of the nation had improved proportionately? Child mortality had been progressively reduced and the span of human life had been continuously increasing, but it was far from clear that the standard of health of the population had been materially raised. Was there perhaps some connexion between the comparative paucity of results of health expenditure and the meagre proportion of such expenditure devoted to prevention? That positive and preventive health work was for practical purposes outside the scope of the national health insurance fund was eloquent of the need for a new outlook. Our national health insurance system suffered from the fatal defect of concentrating on the treatment of the individual and placing no economic value on the *maintenance* of good health. In the defence services medical care was provided on the principle that the primary duty of the medical officer was to maintain a high standard of fitness in the men under his care. This formed a striking contrast with the way in which the health insurance scheme approached the problem.

Some enlightened individuals were already contracting with their private practitioners for an annual payment to maintain the family in health, and the Chinese had long ago discovered that the right principle was to pay the doctor for health and not for sickness. Why did we, with our Western knowledge of science, persist in applying the contrary principle? The whole history of public health service in this country was one of continued conflict between the claims of the authorities and the rights of the private practitioner. The principle that the patient paid for the treatment consciously or unconsciously obstructed the progress of preventive medicine and the adoption by the public health authorities of a positive health policy. No one questioned the widespread spirit of self-effacing service amongst the members of the medical profession; it was the system which was at fault. Social and ethical values were in conflict. After long years of extensive apprenticeship, it was a duty, both to himself and to the community, for the doctor to become and remain self-supporting. The public did not demand positive health of him, and had no idea of paying for it. The system left him under no choice, and was, indeed, thoroughly unfair to him. A progressive practitioner was precluded by the rules of his profession from giving popular health training in his own locality, while attempts to give education in positive health by signed articles in the Press were prohibited as self-advertising. As things are, the professional organization was justified in its jealous watch over the ethical standards of the profession; yet surely a system which debarred the public from receiving health education in the form most likely to promote health stood condemned!

SUGGESTED REMEDIES

Could we not find a newer and better principle which would help us to use the opportunities offered by scientific knowledge for securing higher standards of health? A layman could not do much more than voice the demand for a positive health policy. It was the medical profession and its leaders who must guide us in formulating such a policy and in putting it into practical operation. In the administrative sphere certain obvious requirements suggested themselves. The transfer of all health functions to the Ministry of Health was the first step, and the health services of the defence forces would also have to be brought into close correlation with it. Waste and overlapping caused by a multiplicity of local sanitary authorities should be avoided by a regrouping of the country into areas for health and medical services. The standard public health area should have the status given to county boroughs and be large enough to allow of the appointment of an adequate health personnel with all reasonable unification of health and sanitary functions; there should also be systematic co-operation of all hospitals. The administration of medical benefit by Insurance Committees should be transferred to the local health authorities, and provision should be made for the application of a portion of the insurance fund to positive health work.

Apart from administrative changes, it was important that money provided from public funds should be devoted, not to the treatment or care of individuals, but to the raising and maintenance of health standards. The Pioneer Health Centre at Peckham had reached the striking conclusion that health demanded responsibility, and could not be enjoined through any system of charity. It further found that, given an opportunity, the artisan was prepared to spend money in taking responsibility for the maintenance of his own health and that of his family. None of these trains of thought led on to the establishment of a State Medical Service. Just as, in the question of industrial reorganization, the idea of nationalization under the heavy hand of Government Departments and State regimentation grew less and less attractive as its implications became clearer, so it was with the idea of a State Medical Service. A new way must be found which would reconcile freedom with conscious forward planning. Certain principles were clear: emphasis must be on prevention rather than cure, on the health of the family, or group, and not on the sickness of the individual patient; means must be found to give the doctor a financial interest in good health.

Whatever else was required the first need was clearly for more and better health education, and in this direction there was not only need, but obvious opportunity, for immediate practical action. In this country, after two generations of compulsory education, the teaching of positive health was almost entirely neglected in the curriculum. We had medical officers and examination of school children, but education was focused on individual defects, and neither the school medical officer nor the teacher was specially charged with the task of instructing the scholar in healthy behaviour. Funds already available under the national health insurance scheme could well be used for the purpose of health education. This popular health education should also be adopted for adults, and there might reasonably be included active endeavours to encourage contracts with the family doctor on a yearly basis for the keeping of the family in good health, with special insurance arrangements for emergencies outside the control of preventive medicine.

Finally, positive health demanded a change in the bias of medical education. Increasing attention had been given during recent years to the preventive aspect of medicine in the training of medical students. The growth of modern knowledge of heredity, of nutrition, and of the physiological and psychological requirements of man, was progressively affecting the teaching of the medical schools, while the appointment of the Medical Research Council and its achievements during the few years since its foundation were amongst the most helpful signs of real progress. The scale of remuneration for those engaged in curative medicine was, however, still far in excess of that which was open to those desiring to work in the field of prevention. Consequently this type of work offered relatively few attractions for the best minds among the young men and women as they passed through the medical schools.

In conclusion, Sir Basil Blackett said: "A layman takes many risks when he ventures into the field

of medicine. In particular he is apt in his impatience for results to underrate what is already being accomplished and to seem to belittle the great work of a noble profession. That is not the purpose or the intention of this address. Far from it. The purpose of this address is to make a threefold plea: a plea to the State to take stock of the results of public expenditure on public health ; a plea to the public to demand full value for such expenditure, and in doing so to change its values and to focus its own activities on the attainment of positive health ; and, above all, a plea to the medical profession not to be content with following methods and systems of the past, but to lead us in the high task of securing for ourselves and for the next generation, the fruits of its expanded knowledge of medical science and of the laws of healthy living."

Nova et Vetera

BIBLIOGRAPHY OF ROBERT BOYLE

Robert Boyle (1627–91), whom his contemporaries, during the revolutionary period at Oxford, always spoke of as Mr. Broghil, was the great exponent of experimental science in the early years of the Royal Society. He was a precursor of modern chemistry, and was the first to distinguish a mixture from a compound. He discovered in physics that law of gaseous elasticity still known as "Boyle's Law." He made many curious observations on the physiology of respiration. He was somewhat of a novelist, and had strong religious feelings, for he endowed the Boyle Lectures for the defence of Christianity against unbelievers. But, like his contemporaries, he was easy of belief, and was on the side of Valentine Greatrakes "the Stroaker," who was a quack but not a knave.

The bibliography[1] of Boyle's writings has long been overdue, and Mr. J. F. Fulton—a former Fellow of Magdalen College, Oxford, and now professor of physiology at Yale—is to be congratulated, less upon having undertaken the task, than upon having brought it to so successful an issue that it may well serve as a model to future bibliographers.

Boyle's works present peculiar difficulties for the bibliographer. He did not read the proof sheets, says Professor Fulton, he sometimes lost part of his material, he occasionally inserted fresh copy whilst the book was actually in the press. Hence cancelled leaves are common ; the pagination is often disarranged and the signatures are not consecutive. The conscientious bookbinder, therefore, was reduced to despair, and an advertisement for his guidance was printed ; the ordinary binder took no notice of it, and did the best he could, usually with lamentable results. Fortunately, Professor Fulton has what he calls "the anatomical mind" and, with infinite patience, has studied and carefully dissected his material. He has supplied the missing parts, and has rearranged those which were displaced. His method has been to describe each edition bibliographically ; to prefix to each book a short note assessing the value of the contribution, showing how it came to be written and the influence which it exerted upon contemporaries. An immense labour demanding great knowledge. Two hundred and fifty items are dealt with, and are illustrated by twenty-two whole-page facsimiles—many of title-pages.

The book appears as a reprint from the third volume of the *Proceedings of the Oxford Bibliographical Society* and is provided with an excellent index. It may be noted for a second edition that the Library of the Royal College of Surgeons of England has a copy of the Latin edition of *Humane Blood* (No. 147) dated "Ponte Equitis" (Knightsbridge), in the original vellum binding.

D'A. P.

[1] *A Bibliography of the Honourable Robert Boyle.* By J. F. Fulton, M.A. Oxford: J. Johnson, The University Press. 1932. (Pp. 171 ; 22 figures, 1 plate.)

MENTAL HOSPITALS ASSOCIATION

STERILIZATION OF THE UNFIT

At the annual meeting of the Mental Hospitals Association, which was held at the London Guildhall on July 8th, the address from the chair, by Alderman W. E. LOVSEY of Birmingham, was largely occupied with the question of the sterilization of the mentally unfit, which, he said, had caused no little concern to visiting committees. He said that those brought into contact with the inmates of mental institutions were appalled at the problem confronting administrators. In Birmingham there were 2,689 mental patients and 1,688 mental defectives receiving institutional treatment, with a waiting list of 746 defectives recommended for such treatment, and a further 1,168 under supervision or guardianship. The Mental Hospitals Association had sent a deputation to the Minister of Health in February last to urge a full inquiry into the question of sterilization, though the Association had not committed itself to a sterilization policy. The Minister had agreed as to the need for inquiry, and in June had announced the appointment of a scientific committee under the chairmanship of Mr. L. G. Brock, chairman of the Board of Control. In the meantime the Mental Deficiency Committee of the British Medical Association had reported, and anyone who had read that report would realize the formidable nature of the task which awaited Mr. Brock's committee.

Mr. L. G. BROCK, in a brief address to the Association, said that the view of the Minister was that this question had to be approached in stages. Sterilization, whatever its advantages or disadvantages, must excite a great deal of controversy. It was repugnant to the religious principles of many persons ; to others it was unacceptable because it interfered with individual liberty. Both these objections had to be respected. What the Minister felt was that, before he and his colleagues in the Cabinet should be asked to consider the broad issues of policy, much more precise information was required as to the scientific case for sterilization, because many loose general statements were being bandied about and did not rest on detailed investigation. That was the reason for the appointment of the scientific committee to examine the data available, an important part of which consisted of the records accumulated by mental deficiency institutions. It might be that the existing data would need to be supplemented by a much more intensive examination of samples. After the scientific committee had concluded its labours, the broader issue of policy would have to be reviewed by a Royal Commission. His own committee did not pretend to be representative. Its members had been chosen for their individual experience and qualification, but not until it had reported could the broader issues of policy be examined.

Speaking of other matters, Mr. Brock said that the proportion of mental defectives in mental hospitals who could be transferred to colonies varied considerably, but a test census made recently in two county hospitals which were representative of a good many others showed that over 10 per cent. of cases appeared to be suitable for removal to a mental deficiency colony, and could be accommodated there at much less cost than by extending the accommodation in mental hospitals. The Board of Control was about to urge on local authorities the need for considering how far the problem of overcrowding could be met by a transfer of some of their employable or trainable mental deficients to some mental deficiency institution. A long discussion took place on the hours of duty in mental hospitals. A committee of inquiry set up by the Association had presented a report which recommended that the maximum hours of duty for the nursing staff per week should be reduced from sixty-six to sixty-two and a half (these figures including meal times). Some speakers at the meeting favoured a more considerable reduction, with the idea of approximating to a forty-eight-hour week (exclusive of meal times), but a motion to refer back the report which urged the more modest reduction was defeated by a considerable majority.

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THE TEACHING OF BIOLOGY

The General Medical Council now has under review the question of pre-registration examinations. It is perhaps natural, though it seems unfortunate, that this consideration has hitherto been entirely in terms of physics and chemistry. At the meeting of the Council in May, however, attention was called, particularly by Mr. K. W. Monsarrat and Sir Henry Brackenbury,[1] to the importance of the inclusion of biology in the early studies of the prospective medical student, and a promise was given that this should be taken into account in the further consideration of the matter. The point of view then urged has been emphasized and strongly reinforced by the report of the Committee on the Education and Supply of Biologists,[2] appointed by the Prime Minister as chairman of the Economic Advisory Council ; and in the latter part of his discourse at the Royal Institution, published in last week's issue of the *British Medical Journal*, Sir Walter Fletcher makes a powerful and eloquent plea in the same direction, mainly in the interest of medical research.

Biology has come late into the educational field, and the more serious consequences of this late arrival are at least threefold. The first is that the value and importance of biology as a purely cultural subject is insufficiently recognized ; or, if it be recognized, that the difficulties of so using it are greatly magnified. If it were desirable—as, indeed, some enthusiasts have held—it would probably be easier to build up the whole of the school curriculum, from the earliest years up to the leaving age, round the subject of biology than round any other. In any case, the opinion of the Committee of the Economic Advisory Council is definite enough. They say: " We hold strongly that no boy should leave school without having been introduced to biology, and that therefore the time-table should be so adjusted that biology, as a cultural subject, should find a place in the curriculum of every secondary school." The " every " in this sentence must be taken to indicate that what applies to boys is applicable to girls also. A second result is that advanced courses, whether at secondary schools or at universities, for those who are beginning to specialize in science are for the most part imperfectly constructed. Up to the pass standard, or at least up to the standard of entrance scholarship for faculties of science, such a course should comprise the three science subjects—physics, chemistry, and biology—with English and one foreign language, preferably German. The only difficulty here is the pursuit of advanced mathematics for those who intend to specialize in physics. Such specialization, however, should not take place too early, for there is a grave danger of turning out a body of really illiterate scientists. A third result of the late coming of biology, allied to the second, is that there is a divorce between the physical and the biological sciences, and that under present conditions of scholarship requirements this divorce tends to perpetuate itself. The competition over a considerable number of years in the field of physics and chemistry has led to an intensification of the teaching and a gradual heightening of the standard of examination tests. It has followed that in many, if not most, schools the teaching of these subjects has got on to wrong lines. It has become less a training in scientific method and fact, and more a matter of technical detail or of mathematical development ; and examination requirements are now such as to discourage at any rate the best scholars from continuing their studies in any different direction. These conditions necessitate a relative abundance of time and attention to chemistry and physics during the school years, so that biology, if introduced, has to be content with the small leavings, or has to be regarded definitely as an alternative to be pressed to a like height of attainment, and even then not so valuable for scholarship purposes. As Sir Walter Fletcher says, " the cleverer boys are diverted from biology, while the biologists, if any, must give up proper training in physical subjects and themselves specialize narrowly if they are to have any chance of scholarship success." The aim should be a well-balanced scientific education, and the remedy, which lies in the hands of the universities and university colleges, is to require a reasonable standard in all these science subjects, together with an adequate command of the languages mentioned.

The consequences of this state of affairs are lamentable. They are, to name the chief, a lack of even elementary knowledge of biological facts among the educated classes ; a narrow and often misdirected outlook in many entrants upon medical studies, involving a considerable loss of time ; a lack of supply of biologists in many spheres in which they are needed ; and a handicapping of research in the most important lines that it can follow. There has, however, been a definite improvement in the extent and character of the teaching of biology in secondary schools of various kinds during the last five or six years ; and both as a consequence of this and as a powerful encouragement to its continuance, it may well be held that the time has come when the General Medical Council might give notice that it will require evidence of a suitable knowledge of biology to be shown in pre-registration examinations. Sir Walter Fletcher has done excellently to remind us that " the problems of the living cell are at least as attractive to a keen mind as those of dead matter " ; and that, in spite of the control over dead matter that applied physical science has now given us, " it is better mastery over living matter and the improvement of the bodily and mental powers of man that are needed for the real betterment and enrichment of the race."

[1] *British Medical Journal Supplement*, June 4th, 1932, p. 268.
[2] H.M. Stationery Office. 1932. (1s. net.)

DYSPEPSIA AND TUBERCULOSIS

Indigestion as a pre-tuberculous symptom and dyspepsia as the result of pulmonary tuberculosis have received considerable attention in the medical literature, and it is now well known that the majority of phthisical patients suffer from dyspepsia, often long before there is manifest disease in the lungs. Dr. Halldór Hansen[1] of the University of Reykjavik, the capital of Iceland, has made a painstaking search of the literature, and a careful examination of a series of his own cases with a view to substantiating the thesis that a chronic benign tuberculosis, or a beginning phthisis, may produce symptoms which are liable to confusion with those of a true ulcer of the stomach.

The celebrated Austrian physician von Jaksch was the first to mention the possibility that dyspepsia of tuberculous origin may simulate a gastric ulcer, but in the following sixty years this view seems to have been overlooked, though much has been written on the dyspepsia of phthisis. Janowski of Warsaw, for instance, in a review of 700 patients with phthisis, found 35 per cent. with gastro-intestinal disturbances, and 14 per cent. whose symptoms were mainly related to the stomach. In the last few years several authors have described cases in which typical symptoms of gastric ulcer occur in what is apparently a primary tuberculosis of the mesentery. In 32 per cent. of a considerable series of patients with symptoms of ulcer, Holler found no clinical or radiological evidence of ulcer ; of these patients suffering from " neurosis without ulcer " no fewer than 68 per cent. showed " tuberculous alteration of the hilus glands." In these cases of mediastinal and mesenteric tuberculosis, and in cases of pleurisy, there are probably two factors producing symptoms—the mechanical and the toxic effects of the pathological state. From the surgical side, too, Dr. Hansen finds evidence for his argument. Starlinger, for instance, operated on 194 patients for peptic ulcer ; of these the operative findings were negative in thirty-three. A year or so later 46 per cent. of the negative cases had died of tuberculosis. Thus Dr. Hansen was led to follow up a series of his own cases, presenting symptoms of ulcer of the stomach, which had proved negative to full clinical and radiological examination, and had been operated on by him without finding evidence of ulceration. He was able to trace thirty-five of these patients, and in order to have a comparative series he followed up fifty cases of true peptic ulcer. The conclusion arrived at is that, of the fifty ulcer cases, thirty-five showed present or past tuberculosis; the remaining fifteen were probably tuberculous, though four only in slight degree. Of the thirty-five pseudo-ulcer cases 80 per cent. were certainly tuberculous, and the remaining seven were strongly suspect. This difference of 8 per cent. seems too little to be significant. It points to tuberculosis being rife in Iceland. Can it be of the importance Dr. Hansen seems to make it? We are almost inclined to dismiss it. And yet he is so meticulous in bringing in every detail, so careful to be fair in weighing each fact, that we are led to examine his argument further.

First, however, to summarize Dr. Hansen's conclusions as to the chief factors which would be indications for the diagnosis of pseudo-ulcer and against the presence of chronic ulcer. The cases of pseudo-ulcer are more likely to be women, with digestive disturbance and discomfort beginning soon after adolescence or in early adult life. The onset of symptoms often follows a febrile illness or an incident that has reduced the patient's strength. The pain is a burning one, often superficial, neuralgic, and spreading, epigastric at first, but more generalized as the patient's age increases. There is not the regular periodicity or constancy over a long time found in cases of true ulcer. Besides, the pain often begins on getting up or after breakfast ; it may even be eased by a full meal. Appetite is poor, however ; there is distaste for milk, sweet and fatty foods, fresh fish and eggs, and vomiting takes place readily. Irregular attacks of diarrhoea with mucous and offensive stools, nervous irregularity of the heart, headaches, lassitude, chills, and sore throats occur. There is usually secondary anaemia, not following manifest or occult bleeding, considerable loss of flesh, and often slight fever. Finally, the patient responds little to an ulcer cure, but is benefited by rest and feeding up, a fresh-air life, change of climate, and tonics. Every practitioner will remember cases conforming to this description. He will remember, too, that such patients have been regarded at different times as suffering from gastric diseases (gastroptosis, chronic gastritis, perigastric adhesions) or extragastric troubles such as chronic pancreatitis, cholelithiasis, colitis, constipation, affections of the circulatory apparatus, anaemia, or disturbances of the vegetative nervous system. In Dr. Hansen's series of cases simulating ulcer the outstanding features were: chronic gastric catarrh, constipation and colitis, anaemia, intercostal neuralgia, and latent focal sepsis, especially slight forms of tuberculosis. Arguing each point with the pertinacity of Father William, Dr. Hansen concludes in favour of tubercle being the only satisfying explanation in these cases. No other single cause, producing as it does symptoms in different organs and in general, will meet the requirements ; by exclusion tubercle appears to be the most probable aetiological factor in these patients with digestive disturbance simulating ulcer.

The gastric lesion may be brought about by toxins absorbed from tuberculous lesions elsewhere in the body and brought to the stomach in the blood stream. The nerve control of the stomach may be influenced, either directly by reflexes originating in pathogenic foci in mesenteric gland or localized peritonitis, or from affection of the vagus in disease of the lung hilus and mediastinum. Or the stomach lining may be directly infected by tubercle bacilli swallowed in the sputum. It will be generally agreed that tuberculosis may produce gastro-intestinal disturbances. Before accepting

[1] *Pseudo-ulcus Ventriculi.* Von Halldór Hansen. Kopenhagen. Levin und Munksgaard. 1932.

a benign form of tubercle as the cause of this group of cases simulating ulcer, further positive evidence will have to be adduced, however. An exact study of the gastric mucous membrane in beginning or benign chronic tuberculosis, with gastroscopic examination and a systematic follow-up of all cases operated on for gastric ulcer, is required. Further, this should be carried out amongst a people not so riddled with tubercle as the inhabitants of Iceland. Dr. Hansen's theory is deserving of note, although other mild chronic (pyogenic) infections may play a part in causation.

"PREPARATION FOR MARRIAGE"

A handbook " for ministers of religion, medical practitioners, and all responsible for the guidance of young people," and dealing with problems and difficulties connected with marriage, has been prepared by a special committee on behalf of the British Social Hygiene Council. It is entitled *Preparation for Marriage*,[1] and the method of its composition is quite unusual. It was originally planned as a symposium setting out the views of different specialists on the subject with which it deals. But when these contributions were brought together it was found that they did not make up a satisfactory and coherent whole. They revealed redundancies, and even disagreements, and a degree of scientific and somewhat unsympathetic aloofness out of harmony with the purpose. The remedy adopted was to pass the contents of the pool so formed through " the unifying channel of a single and not too scientific pen." To minimize any danger of thus introducing an individual bias which might jeopardize an unprejudiced exposition of the subject, the work is prefaced by a brief but frank statement of the personal reactions of the editor, and no doubt there was continued watchfulness on the part of the original contributors and of an expert body of advisers. The " unifying pen " is that of Mr. Kenneth Walker. The contributors are Professor Malinowski, Miss Camilla Wedgwood, and Drs. H. Crichton-Miller, I. Feldman, and C. J. B. Voge ; while in the list of advisers appear such names as those of Sir Henry Simson, Professor Eley Crew, and the Rev. T. W. Pym. The result justifies the method. It is an excellent volume. If such a task had to be undertaken, it is difficult, viewing the matter broadly, to see how it could have been better performed. There are, of course, still those who say that such instruction as that given in this book is not only needless but harmful. These persons are mainly of two classes—the prude and the mystic. Their points of view are acknowledged in the book itself, and, as far as need be, are dealt with by a kindly logic. By most social workers of common sense and experience, including doctors and the clergy, however, it is recognized that, just as it is now admitted that good motherhood is not purely a matter of instinct and may well be improved by training, so there is definite need, in many cases, for instruction in matters of sex and sexual relations. The report of the Lambeth conference of 1930 laid special emphasis on this need. Such instruction can often best be given by the family doctor, but there are obviously a large number of cases in which he is not the best qualified or the most suitable person for the purpose, and there may be every advantage in friendly guidance being given by others who are qualified to do this, provided that care be taken to refer to the medical practitioner when any question of a predominantly medical character arises. Many such advisers, both medical and lay, have felt that there were certain aspects of the subject on which they lacked the necessary scientific knowledge. It is mainly for them that this book has been written. The combination and unification of these contributions from a clergyman, medical men, a physiologist, a psychologist, two anthropologists, and an expert in genetics is set out in a logical series of chapters dealing with the essentials of marriage and the family and their place in human life, with courtship, sexual intercourse, heredity and genetics, fertility and sterility, birth control, continence, and other relevant matters. These are all very difficult subjects, but the discussion is in each case skilful, delicate, and practical. The section on genetics is necessarily very incomplete and a little dogmatic, but it would have been interesting and probably advantageous to insert a paragraph and an example with regard to sex-linked inheritance. The quotations by way of chapter mottoes are noteworthy, and there is a useful glossary and bibliography.

[1] *Preparation for Marriage.* A handbook prepared by a special committee on behalf of the British Social Hygiene Council. With a foreword by the Bishop of Liverpool. London: Jonathan Cape. 1932. (Pp. 191 ; 5s. net.)

THORIUM DIOXIDE AS AN X-RAY CONTRAST MEDIUM

Very soon after the discovery of *x* rays in 1895 by Roentgen a few of the early workers advocated the use of radio-opaque substances so as to provide contrast shadows, thus making it possible to examine by *x* rays the oesophagus and stomach. One of the earliest records is by Strauss,[1] who in 1896 thought that use could be made of the radio-opaque properties of metals for diagnostic purposes. He filled gelatin capsules with reduced iron oxide and with bismuth subnitrate. These were swallowed by the patient, and on screening Strauss was able to see the shadows of these capsules. He did not, however, continue the investigation, as it appeared to him to be of less practical importance than the question of changes of translucency to *x* rays caused by tumours. This is probably the earliest record of the use of opaque substances in the *x*-ray examination of patients. Since that time many substances have been used. First we had the development of the *x*-ray investigation of the gastro-intestinal tract by means of bismuth or barium ; this has now become an established routine. Of late years many new substances have been introduced. In 1924 Graham, Cole, and Copher, by the use of sodium tetraiodophenolphthalein, provided a new method for the investigation of the gall-bladder. Retrograde pyelography for many years has been carried out by means of a solution of sodium iodide, and recently von Lichtenberg of St. Hedwigg's Hospital, Berlin, succeeded in producing an opaque substance called " uroselectan B," which is a pyridine derivative with 51.2 per cent. of organically combined iodine. Introduced intravenously, it is quickly eliminated by the kidneys in concentration sufficient to give satisfactory radiographs. The latest preparation of a similar character is thorotrast, which is prepared by

[1] Strauss: *Deut. med. Woch.*, 1896, xxii, 161–3.

von Heyden of Dresden. Thorotrast is a stabilized thorium-dioxydsol containing 25 per cent. of thorium dioxide. It can be diluted with water or physiological salt solution, and is non-poisonous and non-irritating. It gives a very dense shadow, and consequently can be used in retrograde pyelography in a dilution of 1 in 2, in cystography in a dilution of 1 in 5, and in the examination of the tracts of fistulae in a dilution of 1 in 1. The films obtained undoubtedly show that it is excellent as a contrast medium. It has been used intravenously in order to obtain dense shadows of the spleen and liver, but here much more care is required, as overdosage produces very distressing symptoms of shock. It must also be remembered that it is very slowly eliminated ; in fact, after a period of six months there is very little difference in the density of the shadows of the spleen and liver. As thorium is mildly radio-active there is here a potential source of danger, for we do not yet know what the effects are on these organs after a long period of time. In experimental work on animals slight necrotic changes have been described as occurring in both spleen and liver. Up to now experience has shown that an average total dose of 50 c.cm. of thorotrast given intravenously is required in order to produce satisfactory shadows of the spleen and liver. It must be given in fractional doses, never exceeding 0.3 c.cm. of thorotrast per kilo of body weight. This dose in a patient weighing 70 kilos would represent 21 c.cm. of thorotrast. Kadrnka,[1] who has carried out extensive experimental work on animals, usually begins with 10 c.cm. of thorotrast, increasing the amount at subsequent injections to 15 or 20 c.cm. He gives the following table, showing the quantity of thorotrast necessary for hepatosplenography.

Weight.	Thorotrast.	(Thorium metal).
40 kilos	30.0 c.cm.	6.60 grains
50 kilos	37.5 c.cm.	8.25 grains
60 kilos	45.0 c.cm.	9.90 grains
70 kilos	52.5 c.cm.	11.55 grains

He further advises that thorotrast should be administered diluted at least ten times with a 5 per cent. glucose solution. It is sterilized by heating and injected in increasing doses over a period of four to six days, according to how it is tolerated by the patient. The total dose should not exceed 0.75 c.cm. per kilo of body weight, and should always be injected at body temperature. He has carried out this technique in several cases, and so far has experienced no disasters. He states that the thorium remains in the liver and spleen for a long time, and thinks that in certain cases he has obtained a beneficial therapeutic reaction. Stewart[2] has carried out this method of investigating the liver and spleen, and states that the liver and spleen are clearly and sharply outlined: in one case neoplastic formations in the liver were demonstrated. In a series of eight cases the injections were well tolerated in five ; in three there was sickness and vomiting after the second injection ; and in two haemorrhages occurred. According to Stewart the material probably remains permanently in the cells of the liver and spleen, and may be a potential source of future trouble. In one of his fatal cases "the spleen left over a photographic plate for a day contained enough thorium to register an image on the plate," while control spleens gave negative results. In four post-mortems he found acute splenitis, but was doubtful if this was due to the thorotrast. The literature on this subject is considerable, some fifty papers having been published. Santos, Reynaldo, and Caldas[1] have used thorotrast for arteriography, as also as Heuser.[2] It would appear that thorotrast is an excellent contrast medium for retrograde pyelography, but that at the present time great care must be exercised in using it intravenously in order to produce strong contrast shadows of the liver and spleen. The injection is sometimes followed by very severe reactions, and overdosage may have disastrous results. The use of thorotrast intravenously does not give sufficient independent information to justify its administration. Further research work is necessary before it takes its place as a diagnostic method in the examination of the liver and spleen.

[1] Kadrnka: *Journ. Radiol. et d'Electrol.*, April, 1932, 149 ; *Radiology*, 1932, xviii, No. 2, 371.
[2] Stewart: *Amer. Journ. Roentgenol. and Radium Therapy*, 1932, xxvii, No. 1, 53.

[1] Santos, Reynaldo, and Caldas: *Medicina Contemporanea*, 1931, No. 26, 234.
[2] Heuser: *La Semana Medica*, 1932, No. 1, 54, and No. 13, 1053.

QUARANTINE AT CHINESE PORTS

In spite of the turmoil of war in China the National Quarantine Service has consolidated its position in maritime sanitation, and has taken over, during the past year, the additional ports of Amoy, Swatow, Newchuang, Antung, and Hankow, which are administered from the central organization at Shanghai. The quarantine clinic at Woosung was totally destroyed during the Japanese bombardment, and this important station at the entrance to Shanghai had to be abandoned. But although many activities of the Service, owing to the dislocation of shipping and big armies, were curtailed, it is now rapidly regaining "normalcy." The report for 1931[3] deals with the first calendar year of the Service since it was separated from the Maritime Customs and made a Chinese national institution. As pointed out in our review last year the quarantine regulations promulgated by the Chinese Ministry of Health were evolved by the aid of the League of Nations Health Section, and embodied all the latest features of this branch of public sanitation. The Service has done its best to carry out both the letter and the spirit of the regulations. From October, 1930, to December, 1931, there were 2,931 vessels, with a gross tonnage of 18,067,577, inspected at Shanghai and Woosung ; 975 vessels were fumigated, and a good beginning was made with junk traffic, as over 5,000 of these elusive vessels were inspected and disinfected during the year. The fumigants used were sulphur dioxide gas and CO–CO_2 gas mixture. In a newly installed barge the better control of the CO–CO_2 gas has been obtained, by which its quality as well as quantity can be determined. Zyklon B (hydrocyanic acid fumigant) is available, but the high cost of operation, and the difficulty of completely isolating the vessel as it lies in busy Shanghai roadstead, interfere with its more general use. A rat and flea survey of the port has been conducted by Dr. Wu Lien-Teh and his staff: they also co-operated with the municipal health officer of Greater Shanghai in campaigns against cholera and small-pox. This Series II embodies the reports of Chinese doctors of the Service who have travelled abroad in order to note the latest features of port health

[3] Reports: National Quarantine Service, Series II. 1931. Edited by Wu Lien-Teh and Wu Chang-Yao. Shanghai: National Quarantine Service, 2A, Kiukiang Road.

work in the leading European and American harbours. Though still in its infancy the Chinese National Quarantine Service bids fair to justify its creation.

THE BLIND AND KNOWLEDGE OF SPACE: JANUS STOLP PRIZE

An interesting subject has been chosen by the governors of the Janus Stolp Foundation, University of Leyden, for their biennial scientific competition—namely, "An original contribution on the psychology of the knowledge of space in the blind." Von Senden's analyses of observations[1] made on persons born blind have been specially valuable in the elucidation of this problem of space knowledge, and it is thought that analogous observations should be capable of scientific criticism. The attention of candidates is drawn to the education of blind persons in space-orientation, the construction of objects, manual work, and to the question of giving them an idea of geometry (*sensu strictiori*); and reference is also made to a paper by Th. Heller (*Studien zur Blindenpsychologie*) published in Leipzig in 1904. Interesting conclusions might, it is suggested, be drawn from an analysis of the practical work of blind land-measurers, and possibly by observation of blind workmen. Again, a study of the dreams of the congenitally blind might throw some light on the subject of the competition. Though competitors are required to choose only a part of the subject, it must be one of sufficient extent to enable them to make a general summary and a critical review. Entirely theoretical disquisitions, as well as observations embracing too many diverse points, are not desirable. The manuscript must not exceed 40,000 words, and should be sent to the president of the Board, Professor W. B. Kristensen, 31, Witte Singel, Leiden, before January 1st, 1934. It must be typewritten in Dutch, German, English, French, or Latin, signed with a motto, and accompanied by a sealed letter enclosing the name and address of the author. The winning competitor will receive a gold medal of the value of 250 florins and 250 florins in cash, or, should he prefer it, the whole sum in money.

THE NON-PADDED PLASTER CAST

A good many years ago Dr. Virgil P. Gibney of the Hospital for Ruptured and Crippled, New York, introduced a method of treating rheumatoid arthritis by fixation in plaster without padding, the plaster being applied directly to the bare skin. He did not find many imitators, and the method fell apparently into desuetude. Some six years ago Dr. Lorenz Böhler of Vienna introduced a similar use of plaster in the treatment of fractures, with considerable success. Dr. Fritz Schnek, first assistant at the Accident Insurance Hospital in Vienna, has written a guide on the technique of the non-padded plaster cast,[2] which Dr. Douglas Toffelmier of Oakland, California, has translated into English. This contains full directions for the practice of the method illustrated, with many figures, and probably constitutes as complete a guide to the application of unpadded splints as could be written. We would, however, advise its readers to use the greatest possible caution and vigilance in practice. Dr. Böhler and his assistants have acquired the necessary skill gradually and by much experiment. It is very difficult to impart by written and printed words the necessary lightness of touch and appreciation of pressures. There is, indeed, a perilously small margin between an evenly fitting splint in which the pressure is exactly and evenly distributed to all parts, and one which presses unevenly and does great harm. The necessary skill and judgement can properly be acquired only by watching the proceedings of a master of the art, and attempting under his eye to imitate them. It is not a method to be recommended for universal adoption in casualty hospitals.

[1] *Raum und Gestaltauffassung bei operierten Blindgeborenen vor und nach der Operation*, Leipzig, 1932.

[2] *The Technique of Non-Padded Plaster Cast.* By Fritz Schnek, M.D. With a preface by Lorenz Böhler, M.D. Authorized English translation. Vienna: W. Maudrich. (M. 20.)

OUR CENTENARY NUMBER

The British Medical Association was founded by Sir Charles Hastings on July 19th, 1832, and next week's issue of the *British Medical Journal*, dated July 23rd, 1932, will be a special Centenary Number. Its opening pages will include Sir Humphry Rolleston's Bolingbroke Lecture, on the changes in the medical profession and advances in medicine during the last fifty years, and a retrospect by Sir D'Arcy Power entitled "A century of surgery." In an illustrated note on the Founder's birthplace Mr. George Morgan, of Brighton, records the outcome of his recent visit to Bitterley, in Shropshire, of which the Rev. James Hastings was rector in 1794, when Charles, his sixth son, was born; and another short historical paper will be accompanied by a reproduction of Sir Thomas Brock's bust of the Founder, now in the Victoria Institute, Worcester. We shall publish also an abridgement of the chapter on the Association's Journal from the *History of the Association* which Mr. Muirhead Little has prepared for issue in book form to members attending the Centenary Meeting. A short account of the Association's headquarters in London will be illustrated with two views of the building and a plate reproduced in colours from a sketch of the Great Hall.

The *Supplement* to our present issue contains the full programme for the twenty-four Scientific Sections of the Centenary Meeting, a synopsis of the general time-table, and much other information which should be of use to members who propose to take part in the proceedings.

THE HALF-YEARLY INDEXES

The usual half-yearly indexes to the *Journal* and to the *Supplement* and *Epitome* have been printed; they will, however, not be issued with all copies of the *Journal*, but only to those readers who ask for them. Any member or subscriber who wishes to have one or all of the indexes can obtain what he wants, post free, by sending a postcard notifying his desire to the Financial Secretary and Business Manager, B.M.A. House, Tavistock Square, W.C.1. Those wishing to receive the indexes regularly should intimate this.

We regret to announce the death of Dr. Bedford Pierce, for many years medical superintendent of The Retreat, York, and for a short time a commissioner of the Board of Control. Dr. Pierce was a past-president of the Royal Medico-Psychological Association of Great Britain and Ireland, and of the Section of Psychiatry of the Royal Society of Medicine.

THE MAYO CLINIC: A PERSONAL EXPERIENCE

[FROM A CORRESPONDENT]

HAVING recently visited the Mayo Clinic in order to place myself (or more correctly, my ulcerated gastro-jejunal anastomosis—a sequel of partial gastrectomy) in the expert hands of Dr. Donald C. Balfour, it occurred to me that my experiences might be interesting, in a general way, to readers of the *Journal*. First, a few words of history. Everyone has heard of the Mayo Clinic, but not many, I think, could place their finger on its exact location on a map of the United States. There are seventeen Rochesters in the States, but Rochester, Minnesota, home of the clinic, is situated in the south-eastern part of that State, which forms part of the " Middle West " and abuts on the Canadian border to the west of Lake Superior. The history of Rochester dates back to 1854, when a party of United States surveyors set stakes through what is now Olmstead County. During that year George Head built the first house, a log structure, at the head of what is now the principal business street. Head called the place Rochester because it reminded him of his native city, Rochester, New York State. In 1856 this pioneer settlement had a population of less than 50, and in 1857 it had grown to 600. During the next year, in consequence of a " go West " urge, a great tide of immigrants, particularly from the New England States, pushed westwards through Rochester, many remaining to swell the population to 1,500. Since 1900 Rochester has maintained a record as being the fastest-growing city in the State of Minnesota, consistently showing a 50 per cent. increase of population during each of the past three decades. It is interesting to note that the present population is largely Scandinavian in origin.

ORIGIN OF THE MAYO CLINIC

The Mayo Clinic may be said to owe its origin to a tornado which devastated the entire northern section of Rochester in 1883. The medical services then organized by Drs. William James and Charles Horace Mayo, in conjunction with their father, William Worrall Mayo, formed the embryo out of which grew, with the years, the present renowned medical institution. It must not be thought, of course, that the clinic has always been housed in its present magnificent home. Like many another famous medical centre, it had its beginnings in humble surroundings, which were gradually enlarged with the increasing numbers which came to Rochester to seek relief. Even as late as 1912, however, the clinic was housed in quite a modest building, which now forms a mere annexe to the present structure. Erection of the latter was started in 1914 and completed in 1929. In the tower was installed a carillon, dedicated to the American soldier, as a gift of the Drs. Mayo. Twenty-three bells (made, by the way, at Croydon), weighing some 37,000 pounds, each day ring out a message of good will and cheer to Rochester's visitors. Tall (sixteen stories), stately, cathedral-like, this structure exemplifies the spirit of unselfish service which has permeated the institution since its inception, and, indeed, seems to radiate throughout the surrounding town, whose inhabitants display a delightful old-time courtesy which surprises the visitor with preconceived notions of Middle West " barbarity." Along with the growth of the clinic there has been a corresponding spread in hospital accommodation, which at present has a total capacity of 1,600 beds, surely a unique figure for a town of little over 20,000 inhabitants.

THE JOURNEY TO ROCHESTER

And now about getting there. One may go either by Montreal or by New York. If expense is no consideration, the latter route is recommended as time-saving; indeed, by flying from New York via Chicago it is possible to reach Rochester from this country in less than a week. I went by Montreal, thence by train via Chicago—this takes about nine days. Arriving in Montreal after an uneventful passage (save the usual fog and icebergs off Newfoundland), I joined the " International Limited " at 4 p.m. for Chicago. It may not be generally known that this train is claimed to be the fastest in the world, on its *average* speed and run, which is over fifty miles per hour (848 miles in sixteen and a half hours). American trains are almost entirely made of metal, and are consequently much heavier than ours. The wheels are much smaller, so that, although the track is not nearly so well laid, one glides along quite smoothly and with deceptive speed. The "sleeper," however, is liable to rude shocks at intermediate stations should coupling (which is " automatic ") be performed, the absence of buffers making this process resemble a minor earthquake. The sleeping accommodation is arranged quite differently from ours, the bunks (much broader) being laid " fore and aft " in two tiers on each side, instead of " athwartships " as on British trains. There is no separation of the sexes, so that it is necessary to undress lying on one's bunk with the screens pulled to and buttoned together. The small hammock stretched across the double windows is not meant for a baby, but for one's clothes. A large toilet room is provided at each end of the car, with four or five wash-basins. Here American efficiency goes the length of providing slots for the disposal of used razor blades, and a special basin at which to brush one's teeth. After a fairly comfortable night I arrived at Chicago (Dearborn Street Station) punctually at 8.30 a.m., to learn a little later that Al Capone, the notorious gangster, had left this station only the night before for gaol in Georgia. I neither saw nor heard anything further of gangsters. To get to Rochester one transfers here to the North-Western Station (or depot, as it is called in America), to join the 10.20. As this train is for the most part a " local," and the journey (ten and a half hours) consequently tiresome and dusty, it is better (and only slightly more expensive) to fly from Chicago to Rochester (2 hours 40 minutes).

ARRIVAL AT THE CLINIC

Presenting myself at the clinic the morning after arrival at Rochester, I was courteously received by the lady receptionist and directed to " register," when one is given a cardboard container (for holding subsequent appointment cards) bearing a number (mine was in the 800,000's), which henceforth appears on all documents relative to one's case. I was first sent to the medical section, where a junior physician made a routine general examination after a very detailed history-taking. Thereafter I visited the *x*-ray department (screening and plating), the nose and throat department, had the routine blood examinations (cell counts, haemoglobin and blood urea estimations), visited the dental department (dental radiographs), had a gastric analysis, and finally had an interview with Dr. Rosenow of " elective localization " fame. Dr. Rosenow showed me some most interesting specimens and slides bearing on the elective localization of ulcer-producing streptococci. In view of what was subsequently found at operation, it is somewhat sad to relate that this exhaustive examination (some of which, by the way, is performed by skilled lady assistants) was negative save for slight evidence of spasm at the anastomosis and the presence of a small amount of blood-clot in the " fasting " juice.

CO-OPERATION AND KEENNESS

After the examination had been completed, my data were collected and discussed by the principals concerned in my case. And herein, in my opinion, lies the distinguishing feature of the Mayo Clinic. Medical science

is much the same the world over, and in the long run it is men, not bricks, that make a medical school; but the freest co-operation and intercommunication are features of superlative importance which are only too often lacking in our own clinics. "Watertight compartments" are simply non-existent at the Mayo Clinic. All the specialties are gathered together under one roof, and what would take weeks to accomplish in London can be done at the clinic in two days, and with the greatest ease—one need not even go out of doors (a boon in wet weather) as the principal hotels communicate with the clinic by subways. In addition to the co-operation described above, one other feature impresses the visitor strongly—the keenness shown without exception by the staff in their examinations. In consequence one comes away from an examination with a feeling that the examiner has put his very best into his work, and has gone into one's case as deeply and thoroughly as he possibly could. To anyone who has encountered slipshod methods elsewhere this keenness is particularly pleasing. No doubt, of course, my own case, coming as I did all the way from Britain and from the hands of some of our highest authorities in surgery and medicine, aroused exceptional interest; yet, so far as I could observe, this earnestness was apparent in all the normal activities of the clinic.

Operation and Return

It must be noted that the clinic exists solely for the purposes of diagnosis; no treatment whatever is given in the clinic building proper. Accordingly, next day I entered St. Mary's Hospital for operation. (This hospital claims to have the largest surgical pavilion in the world.) Both before, at, and after my operation I felt particularly honoured to receive visits from Dr. William J. Mayo, whose kindly and beneficent personality seems to radiate well-being and cheerfulness.

Operation revealed multiple perforated jejunal ulcers, the general peritoneum being protected by adherent omentum (I must surely be the first person to cross the Atlantic in such a condition; had I known I would have hesitated). The gastro-jejunal anastomosis (or "hook-up," as it is called in America) was undone; the omentum was separated from the jejunum; the ulcer-bearing part of the latter was excised (and removed to the pathological laboratory of the clinic by an assistant sent specially to the theatre for this purpose—another instance of "co-operation") and an end-to-end entero-anastomosis performed. The stomach was then anastomosed to the second part of the duodenum, close to the papilla. A temporary jejunostomy was made and the abdomen closed. A rapid and uneventful convalescence followed, hastened by the very generous hospitality of my surgeon at his country lodge six miles from Rochester. Five weeks later, blessed with a good prognosis, I was crossing the Atlantic in a very different frame of mind (and abdomen) from what I had on the previous passage.

BEIT MEMORIAL FELLOWSHIPS

A meeting of the Trustees of the Beit Memorial Fellowships for Medical Research was held on July 7th, when the following elections to Fellowships were made:

Senior Fellowship in Tropical Medicine (value £1,000 per annum. Awarded for one further year).—Edward Hindle, M.A., Sc.D., Ph.D. Original Beit Fellow (1910–12); formerly Professor of Biology, School of Medicine, Cairo. Subject of research: Spirochaetosis, with special reference to the causation of yellow fever.

Fourth Year Fellowships (value £500 per annum).—(1) Cuthbert Leslie Cope, D.M., M.R.C.P. To continue his work at the Radcliffe Infirmary and Department of Biochemistry, Oxford, on the excretion by the mammalian kidney of the glomerular dyestuffs and of the inert sugars believed to be excreted only by the glomeruli. (2) Margaret Honora Roscoe, B.Sc. To continue her work on the vitamin B complex, at the Lister Institute of Preventive Medicine, London. (3) Kenneth Allan Caldwell Elliott, M.Sc. To complete his work on peroxidases at the Sir William Dunn Institute of Biochemistry, Cambridge, and then to study tissue respiration from the point of view of CO_2 evolution.

Junior Fellowships (value £400 per annum).—(1) Harold Percival Himsworth, M.D., M.R.C.P. Proposed research: Activation of insulin by a possible kinase; effect of diets of varying composition on diabetic patients. Place of research: University College Hospital Medical School, London. (2) Norman Risborough Lawrie, M.B., Ch.B. Proposed research: Biochemical investigation of the nutritional requirements of protozoa; study of patients with abnormal metabolism of sulphur-containing compounds. Sir William Dunn Institute of Biochemistry, Cambridge, and the laboratory of Addenbrooke's Hospital. (3) Donald Hugh Williams, B.Sc., M.D. Proposed research: Carbohydrate metabolism, particularly the storage of liver glycogen in experimental animals. Department of Physiology, University College, London. (4) David Willis Wilson Henderson, M.Sc. Proposed research: Antibacterial mechanisms in prophylaxis and therapy of tetanus; cultivation of the viruses of louping ill and fowl-pox. Lister Institute. (5) Robert George Ranyard West, M.D., M.R.C.P., D.P.H. Proposed research: The neurological mechanism of tetany and the pharmacology of curare. Physiological Department, St. Bartholomew's Hospital Medical School. (6) Robert Gaddie, B.Sc., Ph.D. Proposed research: Intermediate carbohydrate metabolism of isolated frog's heart; mode of action of insulin in the animal body. Departments of Medical Chemistry and Materia Medica, University of Edinburgh. (7) Frank George Young, B.Sc. Proposed research: Storage of carbohydrate by the liver in experimental animals. Places of research: Departments of Physiology, University College, London, and Aberdeen University. (8) John Michael Robson, B.Sc., M.D. Proposed research: Hormonic factors responsible for the maintenance of pregnancy and onset of parturition. Institute of Animal Genetics, Edinburgh.

All correspondence of Fellows and candidates should be addressed to the honorary secretary, Beit Memorial Fellowships, University College Hospital Medical School, University Street, W.C.1.

OXFORD OPHTHALMOLOGICAL CONGRESS

ANNUAL MEETING

The twenty-second annual meeting of the Oxford Ophthalmological Congress was held at Oxford on July 7th, 8th, and 9th. Members met informally at dinner on the 6th in the Hall of Keble College, which had again offered its hospitality. The advantage gained by the all-too-short stay in the College, where each member is assigned rooms, and becomes for the time being a student again, is one of the features of this successful annual gathering of ophthalmic surgeons. The congress, which was founded by the late Robert Doyne, has met annually, with one exception, in Keble College since 1910. The proceedings were held in the Department of Human Anatomy of the University, kindly lent for the purpose by Professor Arthur Thomson. In addition, in the Scientific Museum, a commercial exhibition was on view, in which the leading firms of ophthalmic instrument makers displayed the latest forms of apparatus. As usual, a large number of foreign members, and others resident in the Dominions, attended the congress, which emphasized once more the international character of the meeting. Among those from abroad were Professor van der Hoeve (Leyden), Dr. Luther Peter (Philadelphia), Professor Pascheff (Sofia), Colonel Robert Wright (Madras), and Dr. Bernard Samuels and Dr. Isadore Goldstein (New York).

Scientific Business

The proceedings began on Thursday, July 7th, when Mr. Bernard Cridland, the retiring Master, welcomed the members, and invested the new Master, Mr. Cyril Walker, with the presidential badge.

Dr. Luther Peter of Philadelphia, in opening a discussion on the treatment of non-paralytic strabismus, excluding operative details, gave a brief statement of the modern conception of concomitant squint; first as to aetiology, and secondly as to symptomatology. Then the factors which interfere with perfect cures were discussed,

such as amblyopia and defective or absent fusion. The necessity for completing all treatment, including surgery if necessary, before the seventh year, in order to obtain maximum results, was emphasized. The steps in treatment were fully and well described; first, as regards refraction ; secondly, prevention and correction of amblyopia ; thirdly, training of the fusion faculty ; fourthly, surgery ; and lastly, post-operative stereoscopic training.

Professor Arthur Hall of Sheffield gave an extremely interesting address on the oculogyric attacks of chronic epidemic encephalitis. With the aid of cinematograph illustrations he showed that the generally received opinion that the eyes always turned up during sleep was incorrect. Professor Hall's paper embodied new and original research work which he has been carrying out recently.

Among the demonstrations, Miss Maddox (London) showed a test series of synoptophore slides for the purpose of grading the intensities of binocular vision ; also a stereoscope on a kinetic principle. Professor Pascheff (Sofia) showed histological slides of dystrophia hereditaria corneae, and conjunctivitis pustulosa suppurativa ; Mr. Arthur Greene (Norwich), a toy projectileless pistol which caused a traumatic cataract in a child ; Mr. Tudor Thomas (Cardiff), transplantation of scleral tissue on to the cornea of a rabbit ; Colonel Wright (Madras), a series of water-colour pictures of external diseases of the eye. Mr. Gerald East (Truro) showed a pair of spectacles which had saved a man from blindness when a serious explosion occurred near his face ; molten metal had been driven into the front of the glasses, causing them to be entirely opaque.

In the afternoon the members visited New College for tea, and were received by Professor and Mrs. Townsend ; and in the evening the annual dinner of the congress was held in the Hall of Keble College. The Master proposed the toast of " The Congress," and Mr. Leslie Paton that of " The Guests," which was replied to by Professor van der Hoeve.

On Friday morning Mr. Zorab (Southampton), in a very interesting paper on glaucoma simplex familialis, described in much detail cases of glaucoma which had appeared through three generations. Mr. Charles Goulden and Mr. H. B. Stallard (London) read a paper on two unusual cases of sarcoma of the choroid.

The Doyne Memorial Lecture was given by Professor van der Hoeve on the ocular signs in the phakomatoses of Bourneville, von Hippel-Lindau, and Recklinghausen. The lecturer showed a large number of slides demonstrating the condition, and he fully explained the conclusions which he had come to concerning the pathology of these disorders. This lecture should be read in the original, as it does not lend itself to a summary. Mr. Burdon-Cooper (Bath) gave an interesting and practical paper on some observations in the practice of refraction, especially with regard to the use of crossed cylinders and his own " orthogon " test.

In the afternoon Dr. Ronald Canti (London) gave a cinematograph demonstration of living tissue cultivated *in vitro*. The members of the congress were deeply interested, and at its conclusion Dr. Canti was accorded an ovation. Professor Pascheff read a paper on the laws of true trachoma, and Mr. George Black (Boston) on the treatment of detached retina by multiple trephining and the application of caustic to the choroid. He described the method in minute detail, pointing out the difficulties of the operation, the length of time it took, and the results up to date. He was followed by Dr. Dastoor on the same subject. In the evening Colonel Robert Wright gave a cinematograph demonstration, with running commentary, on the ophthalmic clinic in Madras.

On Saturday morning Mr. Lindsay Rea (London) described a new cataract knife. Dr. Luther Peter described the O'Connor cinch operation for squint, and also a recession suture which he had found very satisfactory during the last fifteen years. Mr. Roche (Newport) read a very interesting paper on the aetiology of miners' nystagmus. He showed specimens of all the miners' lamps in use, pointing out their advantages and disadvantages. He did not consider that carbon monoxide or methane was the cause of the condition, but attributed it to the lighting conditions.

BRITISH EMPIRE CANCER CAMPAIGN

ANNUAL GENERAL MEETING

The DUKE OF YORK, presiding at the ninth annual meeting of the British Empire Cancer Campaign, held in the House of Lords on July 11th, expressed his appreciation of the progress of work recorded in the annual report. If they could obtain the financial help so vitally necessary for that work they might look with confidence to finding the solution which would mean so much to sufferers throughout the world. After making reference to progress in the direction of intensive propaganda, and to the spirit in which contributions to the Campaign were being made through the country branches, the Duke concluded by offering his sincere thanks to all members of committees and councils of the Campaign for the work they were doing.

Following a vote of thanks to the Duke, proposed by Lord READING, Sir THOMAS HORDER moved the adoption of the report. He said that it showed no slackening of the quest for the cause and treatment of cancer. It was a sound policy to pursue both quests with equal vigour, for it was quite impossible to say along which of those two lines they would first achieve control of the disease. " Control " was a fitter word than " cure ": it was possible to control a disease before knowing its cause. Sir Thomas then dealt with the substance of the report. He felt it good to know that the Campaign was working in close co-operation with the National Radium Commission. They hopefully anticipated the emergence of data which might have far-reaching results, and looked to the Commission to give them the final decision in the matter of bomb therapy.

Sir RICHARD GARTON seconded the motion, and the report was unanimously adopted.

NINTH ANNUAL REPORT

The chairman's report gives, as usual, a brief account of the progress of the work to date. In hinting that the past year may be remembered more for its contributions to fundamental knowledge than for its achievements in the application of knowledge, it recalls that the nature of cancer has engaged much attention and that the answers to the question " What is cancer? " which found most favour a few years ago are now falling under doubt and suspicion. The trend of modern opinion appears to be slowly but steadily changing towards a biological view of the nature and origin of the disease, and it is believed by some authorities that the gene mutation theory, though still possessing many gaps, offers a reasonable means of interpreting many of the ascertained facts about new growths.

CANCER ANTISERUM

As regards the detailed matter of the report, considerable interest seems to centre round the work on anti-cancer serum in experimental animals.

It will be recalled that last year Dr. Lumsden and his co-workers had succeeded in separating the euglobulin fraction of an anti-cancer serum obtained from sheep. This proved to be ten times more effective in destroying cancer cells than the serum from which it was derived. Injections of it were made into implanted mouse tumours S 37 and M 63. Results showed that when the tumour was destroyed by this inoculation reabsorption of cells occurred and cancer immunity followed (autovaccination). Similar treatment of a few spontaneous tumours seemed at that time to augur well for future experiments.

This year this work has been continued, with, so it seems to us, very promising results. Euglobulin was again used for direct inoculation into spontaneous cancers in

mice. The dead cancer tissue, resulting from the injection, together with some living cancer cells, was subsequently removed at operation (thus avoiding the previous difficulty—death of the animal from absorption of dead-tissue products). In an experiment with eighty mice bearing spontaneously developing cancer, antiserum or normal serum was injected into the tumours and the undestroyed portions of them reimplanted elsewhere. If the autoplasts failed to grow the mouse became resistant, so that cancer cells were both prevented from growing and were destroyed. In the control group, treated with normal sheep serum, the tumours were unaffected. Figures showed that in forty-seven mice treated with serum euglobulin 74.7 per cent. were cured, while in forty controls 0 per cent. were cured. Commenting on these results Dr. Lumsden states that there are two curative processes which follow this treatment. Local destruction of tumour cells occurs where the concentration of euglobulin attains a sufficiently high degree. This reaction is rapid, and soon ceases to be effective; but, by a mechanism of autovaccination, it causes the second and equally valuable curative process. The mouse now becomes immunized against cancer, and its tissues acquire an increased resistance which completes the local cure and prevents recurrence. In dealing with the possibility of the use of anti-cancer serum euglobulin in human beings, Dr. Lumsden earnestly begs that no requests for serum should be sent either to the Campaign or to himself.

CANCER-PRODUCING SUBSTANCES

Since the last annual report, which described experiments with the potent cancer-producing substance "1 : 2 : 5 : 6 dibenzanthracene" in pure form, this substance has been successfully used dissolved in fats. In this form it produces connective tissue tumours and sarcomata in rats and mice. The tumours can be passed on by grafting into other rats or mice, and have now reached as many as thirty-seven generations. Work has also been proceeding on mustard gas, which seems to retard the production of cancer by these and other carcinogenic agents, and it has now been established that a 0.05 per cent. solution of the gas applied to the skin of mice which were being treated with "1 : 2 : 5 : 6 dibenzanthracene" entirely prevented the appearance of the tumours.

Further work on tobacco tars has resulted in the conclusion that smoking plays little or no direct part in the production of cancer.

TREATMENT

Observations extending over three or more years on a considerable number of cases treated by radium (cancer of the cervix uteri, breast, tongue, pharynx, and rectum) are now making it possible to estimate with some accuracy the percentage of patients with cancer in these regions who have been cured. The results are rather disappointing, though there are encouraging signs that the percentage of cures is tending to increase as refinements in the methods of applying radium are introduced and as knowledge grows. Work on late radium reaction shows that, doubtless due to the use of better methods which include increased filtration, cases of late reaction are becoming less frequent.

A series of 215 cases of operable tumours of the rectum has been very carefully graded, and the results of treatment followed up during periods up to five years. Three groups are described: (*a*) those with the growth limited to the rectal wall; (*b*) those with extra-rectal spread but no lymph gland metastases; (*c*) those with regional lymph gland metastases. Striking differences in the operative mortality rate and survival rate after operation are found in these three groups. It appears that in group (*a*) rectal excision completely eradicates the disease; in group (*b*) a good prognosis is justified; while in group (*c*) there is a less favourable prognosis. Surgery in group (*c*) is very disappointing. The following figures are of interest. Out of fifty-two patients operated on in 1927 and 1928, 80 per cent. of group (*a*), 73 per cent. of group (*b*), and 7 per cent. of group (*c*) are alive after three years.

OTHER MATTERS

Among the other subjects dealt with in the report are experiments on the specificity of tumour immunity and on the influence of heredity in tar warts in mice; the rate of mitosis and the estimation of the phase of mitosis during which the cell is most readily influenced by radiation; the problem of occupation and cancer; the measurement of the respiratory quotient of growing cells; the radon electroscope, for measuring the strength of radon seeds; observations on the intestinal absorption of carcinogenic substances; and the presence of Zondek's ovary-stimulating substance in the urine in malignant disease. Interesting work has been done in investigating the disappearance of cancerous tumours in the presence of another disease. Fowls with Rous sarcoma were inoculated with *Spirochaeta anserina*. While most of them died the tumour disappeared in those that recovered. Similar experiments have been done with mice suffering from relapsing fever produced by the same organism, and in most of these animals the tumours reabsorbed and disappeared.

TUBERCULOSIS AND THE MILK SUPPLY

MEETING AT THE MANSION HOUSE

The report on tuberculosis of bovine origin in Great Britain, the work of a special committee appointed by the People's League of Health, and reviewed in the *British Medical Journal* of April 2nd (p. 618), was formally presented for approval at a large public meeting held at the Mansion House, London, under the chairmanship of the Lord Mayor, on July 11th. The meeting was attended by leaders of the medical and veterinary professions, members of Government departments, representatives of many municipalities, and persons interested in dairying and agriculture. The British Medical Association was represented by Sir Henry Brackenbury and Dr. C. O. Hawthorne.

After the LORD MAYOR had extended the welcome of the Mansion House and expressed his sense of the importance of the work of the League in this connexion, Dr. W. G. SAVAGE, the chairman of the committee, gave an outline of the report and recommendations. Having pointed out the incidence of bovine tuberculosis, together with the fact that an average of 6 or 7 per cent. of samples of milk were found to contain living tubercle bacilli, he said that the three remedies proposed were: (1) to emphasize the need for starting to deal with the problem of tuberculosis in dairy stock; (2) to encourage the provision of herds free from tuberculosis, the milk to be sold guaranteed as such; and (3) to give the larger local authorities power to require efficient pasteurization of all milk sold in their area. The first was a long-time programme; the other two remedies were capable of immediate operation.

LORD DAWSON ON PASTEURIZATION

Lord DAWSON OF PENN said that of the importance of the subject of bovine tuberculosis there could be no doubt. Its eradication was an urgent problem of preventive medicine. It had been stated that 40 per cent. of the cattle of this country were infected by tubercle; no alarmist conclusions should be drawn from that, because only a small proportion were infective, but at the same time the cow which was infected to-day might become

infective to human beings to-morrow. The remedy was to eliminate tuberculosis from cattle—a long and costly process—and in the meantime by pasteurization to render milk free from danger of causing tuberculous infection. This was no new method ; it had been practised in all civilized countries for a considerable period. It was initiated at Great Ormond Street a quarter of a century ago, through the instrumentality of Dr. Still, and the experience at that hospital had been that it was of benefit, not only in the prevention of tuberculosis, but of scarlet fever, diphtheria, and the like. The utility of pasteurization was well illustrated by the progressive city of Toronto, which some years ago set up machinery whereby the whole of the milk supply was pasteurized, with the result that for ten years there had not been a single death from bovine tuberculosis. It was objected to pasteurization that it diminished the wholesomeness of milk ; but any deficiency in vitamin content could easily be replaced from other foods. If a milk certified free from tubercle was not immediately practicable, there was no other measure open to the community save pasteurization as a general practice. He agreed with the recommendation that the first step should be permissive legislation whereby urban areas might insist that no milk not certified tubercle-free should enter unless it had been properly and adequately pasteurized.

LORD MOYNIHAN ON CONTAMINATED MILK

Lord MOYNIHAN referred to his maiden speech in the House of Lords,[1] which aroused a good deal of resentment in certain quarters. He had then urged that a Royal Commission should be set up, but the People's League of Health had done the work with equal efficiency and much greater expedition. Briefly, 6 per cent. of milk was contaminated, and a very large amount of surgical tuberculosis was caused thereby ; there was evidence also that some small proportion of medical tuberculosis was similarly caused. His speech in the House of Lords was replied to by a representative of the Ministry of Agriculture, and he feared he must describe the reply as jejune and unhelpful. The Ministry did not seem to recognize what a really serious burden of suffering and disease was inflicted upon the people of this country through the drinking of impure milk. The National Farmers' Union had asked him to withdraw certain statements, but he found those statements underlined and enforced with new data in the report now presented. He was one of those who agreed that much more milk ought to be drunk. The consumption per head in this country was only half of what it was in the United States, one-third of what it was in Canada, and one-sixth of the Scandinavian consumption. But it was essential that the milk consumed should not be capable of bringing about disease. Milk producers were not at present encouraged to lay more emphasis on the purity of their product ; indeed, more attention to the matter was paid in Bermondsey than in Mayfair. The public generally should be willing to pay a little more per quart to ensure purity. Pasteurization had been shown to be efficient in preventing surgical tuberculosis and a number of other diseases which followed upon the drinking of contaminated milk. If pasteurization was not practicable, every household should boil all its milk before consumption. Milk producers required education. He had found the National Farmers' Union ill informed as to the truth of the situation. A campaign was needed to bring home to milk producers the seriousness of this question. The incubation period between the drinking of the milk and the exhibition of symptoms was so long that it was not possible, apart from special knowledge, to connect the one event with the other. He was aware of great improvement in milk production which had taken place during the last ten or fifteen years, but with 6 per cent. of milk still contaminated there was evidently room for much more. He hoped also that the nomenclature and classification of milks would be reformed.

The LORD MAYOR OF MANCHESTER, in moving the adoption of the report, referred to his city as one which had for many years occupied a foremost place in the investigations into and the control of the milk supply. Only a short time ago, just before the report appeared, the Manchester City Council had passed a resolution that Parliamentary powers should be obtained to compel the pasteurizing of the whole milk supply of the city, with the exception of the two highest grades of milk—namely, certified milk, and grade A (T.T.) The resolution was seconded by Mr. JAMES MACKINTOSH of the National Institute for Research in Dairying at Reading, who said that the preparation and publication of the report marked a real advance in the study of bovine tuberculosis in relation to the health of dairy herds and the safety of the milk supply. He pointed out that it was very necessary that compulsory pasteurization should not be permitted or used in such a manner as to lower the standard of efficiency in hygienic milk production.

The resolution approving the report and urging upon the Government the imperative need of giving early practical effect to the proposals it contains was carried with a few dissentients, whose spokesman explained that they were sympathetic with the general object in view, but felt that the committee had tied itself down to a particular method of pasteurization, and that recommendations in more general terms would have commanded wider assent.

Sir ROBERT ARMSTRONG-JONES proposed, and Dame LOUISE MCILROY seconded, a vote of thanks to the Lord Mayor, and both paid a tribute to Miss Olga Nethersole, the founder of the People's League of Health and the inspirer and organizer of the inquiry.

[1] *British Medical Journal*, February 21st, 1931, p. 333.

Ireland

Allocation of Sweepstakes to Hospitals

The Committee of Reference appointed in October, 1931, under the Public Charitable Hospitals (Amendment) Act, 1931, to report " as to the proportion in which two-thirds of the available surplus should be divided under Subsection 4, Section 5 of the Act," has issued its report. Forty-four hospitals have been visited, and awards are made as follows (shillings and pence omitted) :

	Claims	Awards
	£	£
(*a*) Repayment of loans (including bank overdraft)	275,526	250,752
(*b*) Building works, site, mechanical plant, and fees	3,577,115	2,764,509
(*c*) Furniture	181,984	117,520
(*d*) Medical, surgical, and pathological apparatus	165,021	131,797
(*e*) Investment (for endowment purposes)...	4,005,596	1,992,386
Gross totals	8,206,345	5,256,964
Deduct amounts received from previous sweepstakes funds	1,270,022	1,270,022
Net totals	6,936,222	3,986,942

In sections 2 and 4 of the report the claims made by, and awards to, the different hospitals, under the above headings, are given. The report points out the main defects of the Irish voluntary hospitals. Operating largely on lines similar to those followed in England, the Irish institutions as a whole lack many features the existence

of which in the hospitals of England and America marks the strong vitality of the system in those countries. Few of the improvements which have followed on statistical and scientific research have found their way into Irish hospitals. A great deal has been achieved in the care of the individual patient, but in regard to the community as a whole, little or nothing of value has been done. Considered in its national aspect, the Irish hospital system reveals a condition which is open to certain criticisms. There was evidence of this in the manner in which claims were presented to the committee. Many hospitals showed an acute lack of appreciation of the proper lines of hospital development in relation to the needs of the community—the main features of the majority of the claims being variously related to a single anxiety—namely, securing the largest possible award from sweepstakes funds. In justification of this anxiety, a programme of building was in most cases hastily considered, generally with a view to increasing the existing accommodation without regard either to the needs of the community served or to any scheme which would extend hospital facilities to classes of patients for whom there is at present inadequate provision. In few cases was there any attempt to co-ordinate claims with those of other hospitals or to investigate the advantages which a unified policy of development would ensure. The following are features to which the committee's attention was directed at an early stage in its consideration of claims: (1) lack of a unified policy and co-ordination between the voluntary hospitals; (2) the linking up and concentration of all forces on a focal point of health, involving co-ordination between general, special, Poor Law, and "fever" hospitals; (3) lack of comprehensive community planning and surveying of precise needs; (4) incomplete and inadequate provision in certain areas for paediatrics, obstetrics, orthopaedics, "fever" treatment, "middle-class" patients.

Derry Mental Hospital

At the annual meeting of the Londonderry City and County Mental Hospital, Dr. John Watson, resident medical superintendent, in his report for 1931, stated that there were 314 males and 225 females in the hospital on January 1st; 55 males and 53 females were admitted during the year. Cases treated numbered 369 males and 278 females; 24 males and 21 females were discharged as recovered, of whom 30 were resident less than six months, and 6 over six months but less than one year; 4 males and 9 females were discharged as relieved, and 1 as not improved—a total of 59, or 54.6 per cent. of the admissions. Deaths during the year numbered 22 males and 27 females—a rate of 9 per cent. of the daily average number resident—9 being due to exhaustion from mania or melancholia, 8 to senile decay, 5 to pulmonary phthisis, and 8 to pneumonia, bronchitis, etc. In 17 males and 15 females the critical periods of life were assigned as the causative factor; prolonged mental stress and sudden mental stress in 5 males and 6 females; epilepsy in 6 males and 4 females; debility, poverty, etc., in 10 males and 10 females; influenza in 3 males and 3 females; and heredity in 2 males and 2 females. Of the age on admission, four were under 20; thirty between 20 and 24; twenty between 35 and 44; twenty-two between 45 and 54; eighteen between 55 and 64; twelve between 65 and 74; and two were over 74. Seventy cases were admitted as urgent by the medical officers, 35 cases were committed by justices, 2 were admitted by order of the Governor of Northern Ireland, and 1 case under sheriff's warrant in pursuance of the Poor Law (Scotland) Act, 1898. As regards chargeability, 45 were admitted from the city and 63 from the county. During the year there were 14 cases of typhoid fever among the patients—an unusually large number.

Scotland

Edinburgh Scheme for School Medical Service

The Public Health Committee of Edinburgh Town Council on June 28th approved new rules regarding the medical examination of children in the schools under the local authority. These embody certain important changes, including the omission of the routine examinations previously made of children at the ages of 9 and 12, and the substitution of a class-room inspection to be conducted by the school medical officers, who will pick out any child considered by the teacher or doctor to be below standard, and will make a further and more complete examination. A special examination of vision and hearing will be made at the age of 7, and all children about to leave school will be examined one year prior to leaving instead of immediately before as at present. The new scheme still requires the consent of the Department of Health and the Scottish Education Department, but is regarded by those responsible for it as a great advance on the medical inspection carried out in other parts of the country. At the same meeting it was intimated that Glasgow Corporation was promoting a Provisional Order requiring that all milk in Glasgow, designed for human consumption, should be efficiently pasteurized before distribution, and it was arranged that representatives should attend a conference in Glasgow on this subject. It was also mentioned by the medical officer of health, Dr. John Guy, that Edinburgh was the only city in Scotland where for some years there had been compulsory notification of measles, and it was intimated that notification would not be compulsory in Edinburgh in the future.

Royal Edinburgh Hospital for Sick Children

The annual report of the Royal Edinburgh Hospital for Sick Children shows that the number of cases treated in the hospital during 1931 was 3,021, as compared with 3,232 in 1930, and the number of out-patients was 6,461 as compared with 6,462 in the preceding year. In the radiological department 3,166 *x*-ray examinations were made, and in the massage and sunlight departments 4,757 and 8,002 cases respectively were treated. The ordinary income of the hospital amounted to £14,510, and the ordinary expenditure £18,749; the deficiency was thus £4,239, as compared with £4,915 at the end of 1931. Legacies during the year had, however, amounted to £10,712. The convalescent home connected with the hospital dealt with eighty-two medical and fifty-two surgical cases. Reference is made in the report to the Edward Clark chair of child life and health in Edinburgh University, to which Dr. Charles M'Neil, a member of the honorary staff of the hospital, was appointed during the year. Lord Pitman, in making an application for increased financial support for the hospital, said that many people took the view that with falling incomes it was the duty of the State to look after hospitals. He ventured to say, however, that a hospital looked after by the State would deteriorate. The voluntary element was absolutely essential; the personal touch and personal sympathy would never be obtained from a State department.

Glasgow Dental Hospital

The forty-seventh annual meeting of the Incorporated Glasgow Dental Hospital was held on July 6th in the new buildings in Renfrew Street, which, as mentioned in these columns on June 11th, were opened last May by Sir Iain Colquhoun. The chairman of the governors, who presided, remarked that they now had the finest hospital of its kind in Britain. With the facilities for dental treatment offered through this institution the

citizens were encouraged to take better care of their teeth. A sum of £27,000 was still owing to the contractors for the building of the hospital, and it was hoped that this would be raised as soon as possible. Dr. J. Forbes Webster, dean of the hospital, said that it was now fully equipped for teaching, and the governors looked forward to the time when the Glasgow Dental Hospital would be one of the foremost dental training centres in the country.

England and Wales

West London Medico-Chirurgical Society

The fiftieth anniversary dinner of the West London Medico-Chirurgical Society was held at the Hotel Rembrandt on July 8th, under the chairmanship of Dr. H. H. Mills, when a large company of members and guests attended in honour of the occasion. The principal toast, that of "The Society," was proposed by Dr. T. Watts Eden, president of the Royal Society of Medicine, who praised the Society because it brought together the consultant and the general practitioner. He paid tribute to the memory of the late Dr. Remington Hobbs, to whom the Society had awarded its gold medal. Dr. Hobbs, he said, had done his main work in ordinary medical practice, and yet at the same time would have his permanent niche in medical history. Dr. H. H. Mills, in reply, reviewed the interesting and useful discussions which the Society had held during its past session, and went on to say that the new position created by the establishment of municipal hospitals made it incumbent upon the Society, which up to now had found its focus in the West London Hospital, to consider the question of much closer co-operation with the different hospitals in its district. Mr. Hamblen Thomas proposed the health of the guests and the representatives of kindred societies. The latter included the presidents of the Medical Society of London, the Royal Society of Medicine, the Hunterian and Harveian Societies, and the Chelsea Clinical Society. Among the other guests whom he welcomed were Sir Thomas Horder, the recent Cavendish lecturer to the Society, Mr. Knapp Fisher, president of the Architectural Association, Mr. A. P. Herbert of *Punch*, and Sir Walter Fletcher. Mr. Ivor Back, responding, said that he was glad to hear that the West London Society had copied the example of Chelsea in having post-prandial discussions. This plan, which combined instruction with social intercourse, had been found in his Society to work extremely well, and to be a means of introducing new members. Mr. A. P. Herbert, also replying for the guests, pursued the theme that the doctor and the humorist had much in common. Hazlitt had said that man was the only animal who laughed and wept, because he was the only animal who perceived the distinction between things as they were and things as they ought to be. It was given to the humorist to see that distinction more clearly than other men, and the object of laughter, therefore, was to bring about a greater approximation to the ideal society. It followed that in Utopia, where everything was as it should be, there would be no laughter—rather a devastating thought. The doctor in the same way, Mr. Herbert continued, was trying to reach a goal in which his own services would be no longer required. This self-effacing attitude was very creditable to both doctors and humorists, and it made them, on such occasions as the present, feel very much akin. Mr. Herbert went on to speak with mild sarcasm of some modern medical fads and fashions, and described his own experiences in a nursing home where he went for the removal of his appendix. They took away not only his appendix but also his name ; he became "the abdominal in No. 17." The nursing home was one of those "nice quiet ones" which might have been situated on platform No. 4 on Euston Station. His nightly troubles were rather added to by a charming night nurse who came on duty at 10 o'clock and told him anecdotes, not at all soporific, of other abdominal patients. Having at last got to sleep about five in the morning, he was awakened at six to be washed. He believed he was the first layman to call attention to that bad practice of waking patients so early in the morning. Mr. Herbert referred to the habit doctors have of using initials to describe various cases and conditions. This was specially so in obstetric cases, where, he understood, the initials "B.B.A." meant "born before arrival." During an interesting event in his own family the nurse happened to see a copy of *Punch* with an article bearing his own initials, "A. P. H." "Oh," she said tactlessly, "that means ante-partum haemorrhage!" Dr. Julius Burnford proposed the only remaining toast, that of "The President," and gave eloquent testimony to Dr. Mills's distinction in various fields and his special services to the Society, where he had proved himself an excellent president.

London Refuse

The Minister of Health, on July 5th, conferred with representatives of the Common Council of the City of London, the Westminster City Council, and the Metropolitan Borough Councils on the question of the collection and disposal of London refuse. The Minister, after reviewing the history of the matter, said that he had invited representatives of the City Councils and the Metropolitan Borough Councils to confer with him in order to discuss with them a suggestion that an advisory committee should be appointed on the question of London refuse. Mr. Samels said that the matter had been discussed at a meeting of representatives of the City Councils and the Metropolitan Borough Councils held on the previous day, and the following resolutions had been passed unanimously:

1. That, in the opinion of this meeting, the proposal of the Minister of Health that a standing committee of representatives of the Common Council of the City of London and the Metropolitan Borough Councils to consider and advise on questions relating to the collection and disposal of refuse in London should be approved by the Common Council and all Metropolitan Borough Councils.

2. That, in the opinion of this meeting, and subject to the consent of the Metropolitan Boroughs' Standing Joint Committee, the proposed standing committee should be constituted within the framework and organization of the standing joint committee.

3. That, in the opinion of this meeting, the proposed standing committee should consist of one representative appointed by each Council direct.

After some further discussion, the Minister expressed his cordial agreement with the terms of the resolutions and his gratification at the decision to appoint a standing committee.

Memorial to Dr. Remington Hobbs

A desire has been expressed by friends of the late Dr. Remington Hobbs that a memorial tablet should be placed in the chapel of St. Mary Abbots Hospital, the institution at which he carried out his work in connexion with puerperal sepsis. A design has already been prepared and approved by Mrs. Hobbs, and a small committee has been set up to receive subscriptions and undertake the necessary work in connexion with this effort to perpetuate the memory of a man whose charm and kindliness towards his patients and colleagues endeared him to all those who came in contact with him. Subscriptions should be sent to the Matron of St. Mary Abbots Hospital, Marloes Road, W.8, and, however small, will be appreciated and acknowledged.

Correspondence

TESTIMONIAL TO DR. ALFRED COX

SIR,—The presentation by Sir Humphry Rolleston and by Sir Ewen Maclean of the portrait of Dr. Alfred Cox to the British Medical Association and of the Book of Names and cheque to Dr. Cox himself will take place on Saturday, July 23rd, at 3.30 p.m., in the Great Hall at Tavistock Square. It is hoped that as large a number of subscribers to the Fund as can possibly attend will do so. It is quite impossible to send individual invitations. —I am, etc.,

E. ROWLAND FOTHERGILL,
Hove, July 7th. Honorary Secretary, General Committee.

PROTECTIVE SERUM AND IMMUNE BODY

SIR,—In a letter published in the *British Medical Journal* of July 9th Dr. J. Fine quotes certain extracts from a book written by us, in support of the view that a serum may possess protective properties in the absence of sensitizing antibodies. The passages which he cites all refer to examples, specifically stated to be the exception in which an antiserum has been shown to possess protective properties in the absence of *demonstrable* sensitizing antibodies—demonstrable, that is, *in vitro*—or to those more numerous cases in which a serum has been shown to possess a particular kind of sensitizing antibody when tested *in vitro*, but has no detectable protective power *in vivo*.

The greater part of each of the sections from which he quotes consists, however, of a reasoned argument suggesting that these apparent divergencies are probably due in the first case to the fact that the *in vivo* is more sensitive than the *in vitro* test, in the second to the fact that not all sensitizing antibodies have a protective action. This view is, we think, explained quite clearly on page 664. The tentative conclusion that we have drawn in this chapter, and in all other sections of the book in which this question is specifically discussed, is that, so far as our present knowledge goes, it is probable that all protective antibodies *are* sensitizing antibodies of the ordinary type, although it may not be possible to demonstrate their activity by the ordinary *in vitro* tests. We have, for convenience of discussion, formally separated antitoxic, from antibacterial, immunity, but there is, of course, no reason for placing antitoxin in a separate category so far as the essential mechanism of specific antigen-antibody union is concerned.—We are, etc.,

W. W. C. TOPLEY.
G. S. WILSON.

London School of Hygiene and Tropical Medicine, July 11th.

THE ORIGIN OF TUMOURS

SIR,—I was much interested by the letter from Mr. des Ligneris which appeared in the *Journal* of July 2nd, criticizing my paper on the origin of tumours, published in your issue of April 30th. Mr. des Ligneris appears to find some difficulty in accepting the gene mutation theory on the grounds that the gene is a hypothetical ultra-microscopical concept. He would appear to be willing to go half-way and accept the cell itself as the hereditary factor; it appears to be the jump into the ultra-microscopical world that chiefly worries him. Most biologists are satisfied at the present day to accept the gene theory of heredity, and to believe that there are certain units in the cell nucleus which are situated in the chromosomes and determine the hereditary factors in the progeny of the cell. He says,

"To assume that the cause of neoplasia is an alteration of one particular gene would lead us no further than to assume the more general 'holistic' view of the constitutional alteration of the whole cell."

On the other hand it does lead us much further, and it was never suggested that neoplasia is due to the alteration of one gene, as the gene theory assumes that a number of genes become altered by mutation and that the variety of tumours is thus explained.

He finds serious difficulties in fitting the fowl tumours produced by a filterable agent, into the theory. I cannot see that there is any serious difficulty in explaining the fowl tumours on the same basis as mammalian tumours, or that they fail to fit into the mutation theory. As I see them, the facts are as follows: A Jensen rat sarcoma can be transplanted from one rat into another rat by transplanting a few of the living tumour cells with a sterile trocar. These cells will immediately begin to grow in the second rat and reproduce the original sarcoma of the first rat. This process can be repeated indefinitely, rat No. 3 being injected with tumour cells from rat No. 2, etc.; this is also true of other experimental mammalian tumours. In the case of the Rous sarcoma No. 1 of the fowl, a substance taken under sterile conditions from the first fowl is injected into a second fowl of the same kind, and a tumour immediately begins to grow of a similar character to the Rous sarcoma from which it was taken. This again can be repeated indefinitely; a third, fourth, or any number of fowls can be injected from each other, the tumour always being reproduced and being specific to its original origin. The only difference between these two cases of Jensen's rat sarcoma and Rous sarcoma No. 1 is that in the case of the Rous sarcoma the substance which is inoculated into the fowl does not consist of tumour cells but a substance which can pass a filter and is cell-free—that is, does not consist of whole cells. In the case of the mammalian tumours it is necessary for whole cells to be transplanted, whereas in the case of the fowl tumours it is only necessary to transplant parts of the cell. There is, therefore, a very definite difference; but it does not seem to me in the least necessary to assume that we have to deal with a different process, the point being that in the fowl tumours some part of the cell nucleus which is small enough to pass a filter is capable of reproducing the original tumour. The peculiarity of the fowl tumour is that the entire tumour cell has not to be transplanted, whereas in mammalian tumours it has.

It does not appear to me that this difference in any way negatives the mutation theory. Dr. Ludford has pointed out that the chromosomes of the fowl are peculiar in that many of them are very small as compared with the chromosomes of mammalian cells. It may be, though we have no proof of the fact, that the fowl tumours are produced by inoculation of the chromosomes of the mutated genes, and these chromosomes are capable, when inoculated into a suitable stroma of another fowl, of re-establishing themselves as tumour cells. It is not necessary to assume that the filterable substance which produces a Rous sarcoma is able to produce a gene mutation in the tissues of the fowl into which it is inoculated. The tumour filtrates appear to me to work in exactly the same way as the Jensen rat sarcoma cells do when inoculated into another rat. The tumour cells are merely parasitic upon the normal cells of the host, but in the case of the fowl some peculiarity of the cells render it possible for transplantation, or grafting, of the cells to take place, without the entire cell being present.—I am, etc.,

J. P. LOCKHART-MUMMERY, F.R.C.S.

London, W.2, July 5th.

INJECTION TREATMENT OF INGUINAL HERNIA

SIR,—Mr. St. George Gray's very interesting paper in the *British Medical Journal* (July 2nd, p. 12) on the injection treatment of inguinal hernia opens up an interesting field of speculation. Ten years ago operations on varicose veins were common. To-day such operations, except minor ligations, are obsolete. It would seem not improbable that in the near future the familiar R.I.H., L.I.H., and D.I.H. may have almost disappeared from hospital operation lists.

The only danger of a major catastrophe appears to be the possibility of injecting the "obturatin" into the sac. If the sac contains a little free fluid this can, as is pointed out, be avoided. But if the sac is empty, as one would expect it to be, especially in a modified Trendelenburg position, it is difficult to see how this unlikely accident can be eliminated. Another point which suggests itself for future observation is the possibility of the irritating fluid leading to the production of sarcoma. I do not think any new growth has ever been reported as following varicose vein injection.

One hesitates to criticize a technique of which one has no experience. Mr. Gray is to be congratulated on a very interesting and original piece of research.—I am, etc.,

A. ERNEST SAWDAY, F.R.C.S.ED.

London, W.1, July 2nd.

BRONCHOMONILIASIS

SIR,—I have read Lieut.-Colonel P. Jauvrin Marett's letter of June 25th with interest, but I am afraid that he has failed to appreciate several points. With your permission I should like to deal with these seriatim.

1. I am reasonably well acquainted with the literature of the subject, and would like to point out that, while the writers quoted undoubtedly recorded cases of "true bronchomoniliasis," these were in the nature of exceptional cases, and did not occur in the numbers which are apparently obtaining in Jersey.

2. Admittedly our experimental animals received large doses of the organism, but these were given intravenously. Consequently, if they were to be eliminated by, and to attack the kidneys (as they did), they would have first to traverse the lungs, where, if they had been truly pathogenic for the pulmonary parenchyma, they should have had ample time to cause local lesions.

3. My series of cases of paronychia, etc., at present recorded are all in adults, and the lesions have too widely disseminated a digital incidence for so simple an aetiology as Lieut.-Colonel Marett suggests.

4. It is common experience in England, at least, for buccal moniliasis (alias thrush) to occur, if not more frequently, then at least as frequently in breast-fed as in bottle-fed infants. Surely this can largely be attributed to the difficulty experienced in bacteriologically cleansing the natural nipples.

5. While I compliment Lieut.-Colonel Marett on his large and no doubt carefully examined series of sputum examinations, I feel that proof is still lacking that any blastomycetes that may be present are really causal.

Surely one cannot argue that, as the mortality from pulmonary tuberculosis has in ten years in Jersey fallen by 44 per cent., this is due to better and more frequent diagnosis of bronchomoniliasis; particularly is this the case when we see from the Registrar-General's returns that even in England and Wales, with their relatively very inferior climate and much larger population, the mortality has been reduced by approximately 12 per cent. in the same period. Surely in both cases there are other factors at work, such as improved sanatorium treatment, earlier diagnosis, etc.; and particularly in England the fall in mortality cannot be due to more frequent recognition of bronchomoniliasis, which is not even separately included in the Registrar-General's list of causes of death.

Again, even granting that monilia are frequently found in sputa, either alone or in association with the *Mycobacterium tuberculosis*, can we necessarily say that these monilia are causal? Particularly as we know that in carcinoma ventriculi (another condition in which stagnation in a septic cavity occurs) yeasts and allied organisms are of frequent occurrence; in such conditions we do not ascribe the carcinoma to the yeasts' pathogenic powers.

Finally, I should esteem it a favour if Lieut.-Colonel Marett would let us know in how many post-mortem examinations he was able to find unequivocal evidence of death from bronchomoniliasis, and how he proposes to show that such monilia that are present are really causal, and not merely secondary invaders, or even accidental air-borne contaminants?—I am, etc.,

DAVID H. HALER,
Pathologist,
The Infants Hospital.

Vincent Square, S.W.
June 29th.

A FATAL CASE OF VINCENT'S ANGINA

SIR,—I am glad that Dr. Graham Lescher (*Journal*, July 2nd, p. 35) has drawn attention to unrecognized agranulocytosis as being a not uncommon condition. He suggests that it was probably the underlying state responsible for the fatal termination in Dr. James's case of Vincent's angina (*Journal*, June 4th). Dr. Lescher emphasizes in his letter the important point that the granulocytopenia pre-dates the sepsis, and that the prognosis depends on the extent of the agranulocytosis.

Numerous cases are reported in the American and Continental literature under the various headings: agranulocytosis, agranulocytic angina, aleukia, aleukia haemorrhagica, thrombocytopenic purpura, and aplastic anaemia. The last (aplastic anaemia) is the only correct name for this condition in the present state of our knowledge, as the others are derived from outstanding symptoms. Aplastic anaemia alone describes the condition, which is essentially failure on the part of the bone marrow to perform its normal function. All grades of the state can occur from minor degrees of unsatisfactory response to infection up to and including the grave fulminating state of acute aplastic anaemia. The term angina is misleading, and is applied on account of the clinical resemblance between the terminal stages of some of these cases and the diseases given descriptive titles such as Vincent's angina, Ludwig's angina, diphtheritic angina, etc., the condition common to all being a spreading phlegmon somewhere in the neck. Use and wont have given angina here a passport to which it is not entitled, and it would help clinical pathology if it were abandoned; it is not even descriptive, as pain is not the outstanding feature in these conditions. Angina pectoris is the only descriptive title in which the word angina justifies its existence. Cases of aplastic anaemia are probably as common in this country as they are in America and on the Continent. They are rarely recognized until the grave terminal stage sets in with an unresisted streptococcal, staphylococcal, or other infection. I have seen a number of these cases both in hospital and in private practice of varying degrees of severity.

In 1928 I published a monograph on acute aplastic anaemia describing in full detail the investigation and treatment of an acute fulminating case in a patient who was fortunate enough to recover completely. Her platelets were nil and her granulocytes fell to 67 per c.mm. (the lowest count recorded in the literature up to this date). She remained in normal health until February last, when she developed (after influenza) an indolent painless otitis media with otorrhoea, for which she consulted me in June. On June 17th

the blood count was: Haemoglobin, 91 per cent. ; red cells, 4,200,000 per c.mm. ; colour index, 1.08 ; leucocytes, 9,900 per c.mm.—polymorphs, 68.0 per cent. ; lymphocytes, 20.5 per cent. ; monocytes, 9.0 per cent. ; eosinophils, 2.5 per cent.—and platelets, 214,000 per c.mm. Arneth count was 24/40/30/6/0—218, and 1608/2680/2010/402/0 per c.mm. Film, no marked change. Van den Bergh test was negative. The count presents a reasonable normal response to this type of infection and shows no sign of a return to the agranulocytic state. After a course of supporting treatment she had a radical mastoid operation on June 30, and her post-operative progress is so far uneventful.

The experience recorded demonstrates that, whatever the cause of the depressed haemopoietic function may be, complete recovery is possible. The development of the habit of making early and complete blood investigations in all doubtful illnesses, as Dr. Graham Lescher suggests, will result in early diagnosis and possibly successful treatment.—I am, etc.,

Bradford, July 4th. A. HAYES SMITH.

AVITAMINOSIS

SIR,—Dr. Chalmers Watson's letter in your issue of April 23rd prompts me to record the following case of scurvy, more especially in view of the references to vitamins and food-deficiency diseases appearing in recent numbers of the *Journal*.

Some two years ago, in the region of the southern border of Abyssinia, a female child, about 8 years old, was brought to me with the history that it had been getting weak, with swelling of the abdomen and legs, for about six weeks.

On examination I found that the child was in a dropsical state and generally enfeebled. The abdomen was enormously distended, the legs oedematous, with purpuric patches, and the skin dry and scaly. The breath had a heavy, foul odour ; the gums were swollen and spongy, and bled when pressed with a probe. The teeth were all present and in perfect condition, and each was firmly fixed in its socket. The oedema of the legs was so marked that it was impossible to determine the presence or absence of subperiosteal haemorrhages. The right heart was dilated, and there was an apical systolic murmur ; the pulse was rapid, irregular, and of low tension. I cannot remember the details as to blood pressure and blood count, but there was a considerable degree of anaemia. There did not appear to be any skeletal changes, nor were there any symptoms or signs of disease of the central or peripheral nervous systems. There were a few moist rales at the bases of both lungs. So marked was the ascites that it was impossible to palpate the liver or spleen. The urine was loaded with albumin, but there were no casts or blood cells. In such a case there could be no doubt as to the nature of the affection.

The treatment, briefly, was absolute rest in bed. On the first day I tapped the peritoneum and drew off several pints of clear, straw-coloured fluid (owing to lack of laboratory facilities no pathological or biochemical investigations were made), and I made several incisions, each about one inch long, through the skin over the oedematous parts of the legs, and wrapped them in sterile absorbent dressings. The only medicament used at first was a 1 in 4,000 potassium permanganate mouth-wash every three hours. The diet consisted at first of small quantities of raw pulped potatoes, fresh tomatoes, and raw onions, gradually increased and added to by lightly cooked spinach, eggs beaten in milk, meat juice and raw meat (cow and sheep), and papaw. That improvement commenced early was indicated by the following facts: (1) the dropsy did not return ; (2) the cardiac condition improved ; (3) the incisions in the legs healed by first intention ; (4) the mouth gradually assumed a more healthy appearance ; and (5) the albuminuria gradually disappeared. After about a month the child was allowed up, and at the end of another fortnight she was perfectly well, and had no trace of the scurvy left. The improvement following rest and varied diet seemed to me to clinch the diagnosis.

The interesting points about this case were that the child belonged to a small section of a tribe that had migrated from Abyssinia into British territory about a dozen years earlier—at any rate before the child was born. There were other children in the same family. About two hundred other people, ranging from infants in arms to aged but not infirm elders, were living in the same village. On making closer inquiry I ascertained that none of the members of the village recollected having seen such sickness before, and it was because of an expected fatal termination that the child was brought to me. The only article of food used by the tribe was milk from about the poorest variety of stunted bush cattle imaginable, and now and again a few of the more privileged might get a bit of flesh from an animal that had died of pleuropneumonia. In certain other tribes, living under exactly the same conditions, the affection was well known, but natives of these tribes volunteered the information upon seeing the child that other members of the tribe were afflicted at the same time, and that one member alone never suffered—in fact, they regarded it as an evil spirit visiting the tribe. They further added that anyone afflicted with it always died. At the time of its occurrence I met with no cases of scurvy in that district. It was just after a very good rainy season, and the cattle supplying the milk were in better condition then than at any other time of the year.

I myself make no criticisms about this case beyond the singular occurrence, and report it trusting that it may offer material for consideration by those engaged in laboratory and other investigations in food-deficiency diseases.—I am, etc.,

Johannesburg, South Africa, May 21st. A. SWARBRECK.

UNIVERSITY OF LONDON MEDICAL GRADUATES SOCIETY

SIR,—The remarkable history of the University of London has recently been brought before the public with the announcement of the dawn of a new era of university development. The time seems appropriate to the publication of a reminder to the medical members of the University of London of the existence of this society, which came into being five years ago under the auspices of some eminent members of the profession. From small beginnings the membership has steadily increased, and is now just five hundred. A few years hence the University will have new buildings of its own on the Bloomsbury site, and this will give an added stimulus to a corporate university life, but in the meantime our society is forming a nucleus of members of the Medical Faculty who believe in the future of their Alma Mater as a centre of social life and activity in a fuller sense than has been possible in the past. The Medical Faculty of London University is one of the largest and most important of the faculties, and it is fitting that it should take a leading place in the development of social life.

The activities of the society are social, and it has no political aims. Members meet three or four times a year at dinners or afternoon gatherings. The summer meeting this year is being held at the Zoological Society's Gardens. The society secured as its first president Sir StClair Thomson, who has been followed successively in the chair by Sir John Rose Bradford and Lady Barrett. Membership is open to all graduates in medicine of the University of London at any time on application to the honorary secretaries. The life subscription is £1. We hope that many who read this will take an early opportunity of linking themselves more closely to their University by becoming members of the U.L.M.G.S.—We are, etc.,

DOROTHY C. HARE,
PHILIP H. MITCHINER,
Honorary Secretaries.

11, Chandos Street, W.1, July 6th.

Obituary

By the death of Dr. WILLIAM JAMES HARRIS, on July 6th, North Dorset has lost one of its most prominent medical men and the borough of Shaftesbury one of its most notable citizens. Dr. Harris was a Wiltshire man, and was educated at Mill Hill School, Cambridge, and Guy's. He held the degrees of M.A., M.D.Camb., and was a Fellow of the Royal College of Surgeons of England. He went to Shaftesbury about thirty-five years ago and continued to practise there until the end of last year, when he retired from active work. During his long period of practice in the district he endeared himself to his patients by his kindness, his sympathy, and his cheerfulness, for he was their friend as well as their medical attendant. Apart from his professional attainments he was a man of wide culture, and was much interested in local government. He was a member of Shaftesbury Borough Council from 1904 to 1926, being mayor twice—in 1906–7 and in 1916–17. He was appointed a justice of the peace for Dorset in 1908, and was vice-chairman of the justices of the Shaftesbury Petty Sessions. He was also president of the local branch of the League of Nations Union, and was associated with many other local bodies. While at Cambridge he was a keen rowing man, and rowed in his college boat; during the last ten years of his life he was a keen golfer.

D. A.

By the death of Dr. W. W. WINGATE-SAUL, which occurred very suddenly in London on July 11th, we have lost a very fine type of medical man, who devoted more than thirty years of his professional life to medical service at sea. Dr. Wingate-Saul was the son of a very well-known practitioner in Lancaster. He was educated at Rugby, Trinity College, Cambridge, and St. Bartholomew's. After graduating he took service with the P. & O. Company, and for thirty years was one of the company's best surgeons. At the time of his death he was medical officer to the s.s. *Viceroy of India*, and was commodore-surgeon in the P. & O. Fleet. He was a well-known figure, principally on the Bombay run, where he made hosts of friends, and won the deep respect of all with whom he came in contact. He was the type of what a ship surgeon should be, and his loss will be sincerely felt both by the company and by the thousands of passengers who travelled with him.

Medical Notes in Parliament

[FROM OUR PARLIAMENTARY CORRESPONDENT]

On July 13th Parliament adjourned for the long recess. The House of Commons has fixed October 27th for its reassembly to complete the session, but it may be called together earlier. On July 12th the Royal Assent was given to the Patents and Designs Act, Extradition Act, Children and Young Persons Act, Town and Country Planning Act, and to other measures. On the same day the Prime Minister made a statement regarding the international agreement at Lausanne.

On July 11th Mr. Chamberlain spoke on national economy. He reminded the House that Old Age and Widows' Pensions, Health and Unemployment Insurances cost £122,200,000 in the current year, and grant services £145,700,000. Big reductions could only be effected in the fields of pensions and insurance or in grants to local authorities.

Spahlinger Vaccine

Sir HILTON YOUNG told Mr. Lennox-Boyd, on July 7th, that, on January 28th, 1932, M. Henri Spahlinger submitted to him a statement of his method for the preparation of antigens, with detailed reference to tuberculosis. He sent a copy of the statement to a number of scientific authorities for their observations, and similar action was taken in Scotland by the Department of Health for Scotland. The following is a summary of these observations:

1. All the authorities consulted draw attention to the general character of the statement and the absence of the necessary details of bacteriological technique. They regard the information supplied as insufficient to ensure that vaccines prepared by other investigators would be identical with those of M. Spahlinger.

2. It is noted that the statement does not relate to the preparation of the curative serum formerly recommended by M. Spahlinger for the treatment of tuberculosis in man.

3. The statement relates to the use of vaccines for the immunization of human beings and cattle against tuberculosis, and it is desirable that the value of these vaccines should be supported by experimental proof.

4. The Medical Research Council, and the majority of the other authorities consulted, consider that if a sufficient quantity of bovine vaccine can be supplied by M. Spahlinger the question of its experimental trial on animals might be considered. To render such tests practicable detailed information from M. Spahlinger in regard to dosage, methods of administration, and standardization would be required.

5. The authorities consulted considered that a clinical investigation of the immunizing value of the human vaccines in human beings on the evidence available would be undesirable.

6. It is understood that the Ministry of Agriculture and Fisheries is in communication with M. Spahlinger concerning arrangements for an experimental trial of the bovine vaccine on animals, and also concerning the details of the method of preparation and administration of the bovine vaccine. The Ministry of Agriculture and Fisheries states that M. Spahlinger has undertaken to supply a sufficient quantity of the bovine vaccine for the experiment as soon as it can be prepared.

Decrease in Industrial Accidents: Home Office Estimates

On July 6th the House of Commons went into committee on the Home Office Estimates. Mr. RHYS DAVIES said the report for 1931 of the Chief Inspector of Factories showed a decrease of accidents from 144,758 in 1930 to 113,249 in 1931, and fatalities declined from 899 to 755. Fatal accidents in the stone and cement industry increased, and the same was true of fatalities due to transmission machinery. He asked whether the Home Office had considered the prohibition of the use of benzole by persons working with cellulose lacquer. Notification of dermatitis should be made compulsory. Deaths from silicosis in 1930 were 241, and in 1931, 319. A better diagnosis might be responsible for the increase, but he was assured that was not entirely so. The report of the first year's working of the Silicosis Medical Arrangements Scheme was shortly due, and he believed it would prove valuable. There was a decline in fatalities from lead paint poisoning, and also a decline in notifiable cases. There was an increase in cases of aniline poisoning, and the number of deaths from anthrax was declining but still unsatisfactory. He asked whether the Home Office was pressing millers to reduce the weight of their sacks to 140 lb.

Mr. TINKER discussed Workmen's Compensation, and averred that because of its administration national health insurance was bearing a burden which it ought not to bear.

Mr. ESSENHIGH said that once miners had nystagmus it was extremely difficult to get them off the compensation books.

Mr. STANLEY, replying for the Government, paid a tribute to the former Chief Inspector of Factories, Sir Gerald Bellhouse, whose last report was under discussion. He said the standard of safety in factories was now good, and rapidly improving by co-operation with the employers. The returns for anthrax showed that between 1930 and 1931 there was a fall of over 50 per cent. in the number of cases, following a fall in previous years. In regard to silicosis he was arranging to meet a deputation from the Miners' Federation. He informed Mr. Rhys Davies that there was no law against the use of lead paint inside buildings. Such use was prohibited by a Convention, which the United Kingdom had not ratified. The use of the 280 lb. sack had been abandoned by practically all the millers in the country. The Medical Research Council was carrying out a special inquiry into miners' nystagmus. As a result of that inquiry the Home

Office might possibly have further proposals to submit to both sides. It was almost impossible to find jobs above ground for men with nystagmus and undesirable for them to return below ground.

The House agreed with the Estimate, and other outstanding Estimates for 1932 were subsequently carried without debate.

Experiments on Animals

Mr. OLIVER STANLEY, answering a question by Mr. Groves on July 6th, said that 745 visits were paid to registered laboratories by the two inspectors under the Cruelty to Animals Act. The report prefixed to the annual return of experiments indicated the steps which were taken to secure observance of the Act. In addition, the Home Office had always been able to rely upon the active co-operation of the responsible heads of laboratories, medical schools, etc., in ensuring that experiments were not performed by unauthorized persons. The Home Office had no reason to suppose that vivisection experiments were performed by students without a licence.

Mr. STANLEY told Mr. Groves, on July 11th, that no certificates were granted by the Home Office in 1930, 1931, or 1932 to vivisectors which authorized experiments on animals entailing the working of dogs and cats on treadmills until overcome by fatigue.

Answering Mr. Groves on July 12th, Mr. STANLEY said that the Home Secretary would not be justified in undertaking a search to secure details of feeding experiments on animals. These were carried out for many different purposes. All experiments on animals involving the cutting out of organs from the body were conducted under anaesthetics under Certificate B. The Home Office had no power to grant certificates.

Duties and Emoluments of Regional Medical Officers.—Replying to Major-General Sir Alfred Knox, on July 7th, Sir HILTON YOUNG said four divisional medical officers on the scale of £1,440–£1,600, thirty-five regional medical officers on the scale of £1,000–£1,400, and forty-three deputy regional medical officers on the scale of £800–£1,100 were employed by the Ministry of Health. These salaries were inclusive—no cost-of-living bonus was payable on them—and they were at present subject to abatements varying from 10 to 7½ per cent. in accordance with decisions of His Majesty's Government. The chief duty of the regional and deputy regional medical officers was to examine insured persons certified as incapable of work and referred for a second medical opinion either by approved societies on the question of incapacity, or by insurance practitioners for purposes of consultation. The bulk of their emoluments was accordingly repaid by societies as an appropriation-in-aid of the Ministry of Health Vote. These officers also inspected the medical records kept by insurance practitioners, and (on behalf of the Home Office) the dangerous drugs registers kept by medical practitioners and hospitals; they interviewed insurance practitioners on questions relating to prescribing, and from time to time made other inquiries and reports required in the administration of the insurance medical service.

Diphtheria Immunization.—On July 11th Sir HILTON YOUNG told Mr. Groves that he would send him a list of firms in this country which manufactured or imported under licence substances used for immunization against diphtheria. He understood that the London County Council also manufactured these substances for its own purpose at laboratories maintained by it.

Cerebro-spinal Fever in the Army.—Mr. COOPER told Mr. Groves, on July 7th, that during the present year there had been fifty-five cases of cerebro-spinal fever in the Army, of which eighteen had proved fatal.

Silicosis in the Pottery Industry.—Mr. STANLEY told Colonel Wedgwood, on July 7th, that he had no information as to the number of compensation claims made in the pottery industry since the Silicosis Order came into operation on February 1st, 1929, but the number of cases in which compensation was paid, up to the end of 1931, was 322, including eighty-seven fatal cases.

Dangerous Drugs Manufacture.—Replying to Mr. Morgan Jones, on July 7th, Mr. STANLEY said that seven firms were licensed to manufacture opium, two to manufacture morphine and heroin, and one to manufacture cocaine in this country. The manufacture was carried on in connexion with the production of other things, and he was unable to say what proportion of the staff or capital was to be regarded as engaged on the manufacture of the drugs. He could not assent to the description of these drugs as noxious. The abuse of them was a great danger, but they were invaluable when used medically. The greater part of these drugs used in this country for medical purposes was of British manufacture.

Road Accidents.—Replying to Commander Marsden on July 6th, Mr. PYBUS said that he did not propose to introduce new legislation for the purpose of reducing the number of accidents resulting in death or injury caused by vehicles and horses in streets, roads, and public places, as this question was prominently before Parliament in the passing of the Road Traffic Act, 1930. He was, however, in consultation with the Home Secretary as to the best means of reducing accidents, whether by enforcement of the law or otherwise. In reply to Admiral Sueter, Mr. STANLEY said that in 1931 5,936 persons were killed as the result of accidents attributed to mechanically propelled road vehicles, including trams and trolley omnibuses. The number of persons killed on the railways, excluding trespassers and suicides, was 339.

Puerperal Deaths.—Sir HILTON YOUNG told Mr. Allan Reid, on July 7th, that the number of deaths classified to puerperal causes in 1931 in Stepney was seven, and in Kensington fifteen. These figures were provisional.

Deaths after Vaccination.—On July 11th Mr. E. BROWN informed Mr. Groves that in 1931 eight deaths were classed to vaccinia; the ages at death were 4 weeks, 2 months, 4 months, 5 months, 10 months, 4 years (2), and 8 years. In ten other cases vaccinia was mentioned on the death certificate, the ages at death being 2 months, 3 months, 4 months (3), 5 months, 6 months, and 7 months (3).

Notes in Brief

The Ministry of Health has no statistics showing the extent to which domestic servants select a panel doctor.

Universities and Colleges

UNIVERSITY OF CAMBRIDGE

The E. G. Fearnsides scholarship for clinical research on diseases of the nervous system has been awarded to J. St.C. Elkington, M.A., M.B., of Trinity College.

UNIVERSITY OF LONDON

The D.Sc. degree in biochemistry has been conferred upon A. F. Watson (University College) for published papers on diphtheria toxin and toxoid and on cancer in rats and mice.

The annual report of the Brown Animal Sanatory Institution Committee records that the five lectures required to be given under the will of the late Mr. Brown were delivered by the Superintendent in December last; the subject was "The future of bacteriological research." It also stated that Dr. Nathan Raw had continued his research on human, bovine, and avian tubercle bacilli with special reference to their value in the immunization of animals and man against tuberculosis.

The annual report of the Graham Legacy Committee stated that the Graham Scholarship is held by Mr. C. L. Oakley; the activities of the laboratories have continued along the usual lines. Grants amounting to £140 were made by the committee to six workers engaged in special inquiries. Professor A. E. Boycott has been reappointed Director of Research under the Charles Graham Medical Research Scheme for one year from September 1st, 1932.

Regulations in regard to the acceptance of the Higher School Examinations as exempting for the Internal Intermediate and First Medical Examinations have been approved and will be issued in due course.

Diplomas in Public Health

The regulations for the Academic Diploma in Public Health (Red Book 1931–2, p. 462) have been amended by the addition of the following sentence at the end of the first paragraph:

A candidate may enter for Part II of the examination in July provided that his registrable qualification was conferred on him two years before the end of that month, and a candidate may enter for Part II of the examination in September provided that his registrable qualification was conferred on him two years before October 31st next following.

The regulations relating to the External Diploma in Public Health (Blue Book, September, 1931, p. 310) have been

amended by the substitution of the following for clause (*c*) of the second paragraph under the heading *Qualification for Admission*:

and (*c*) in the case of the July examination have held a qualification registrable in the United Kingdom two years before the end of that month, and in the case of the September examination have held such a qualification two years before October 31st next following; and (*d*) have in fact registered such qualification.

It has been decided that candidates for the External Diploma in Public Health Examination who enter for both Part I and Part II on the same occasion, but, owing to failure in Part I, are precluded from sitting for Part II, receive back the fee of £5 5s. less £1 1s.

In and after the session 1932–3 the regulations for the First Examination for Medical Degrees (Red Book, 1931–2, p. 190; Blue Book, September, 1931, p. 248) will be amended by the substitution of the following for the first paragraph under the heading *Date of Examination*:

The First Examination for Medical Degrees will take place twice in each year, commencing on the first Monday in July and on the first Monday following December 5th.

Dr. R. A. Young has been appointed the representative of the University at the 18th annual conference of the National Association for the Prevention of Tuberculosis, to be held in London, July 21st to 23rd.

UNIVERSITY OF SHEFFIELD

The following candidates have been approved at the examination indicated:

FINAL M.B., CH.B.—A. H. Briggs (second-class honours with distinction in obstetrics and gynaecology), T. Colver, H. E. Holling, I. A. Jaffe, R. B. Knowles, W. H. Young.

UNIVERSITY OF DURHAM

At the convocations held on June 28th and 29th, the following degrees, diplomas, and licences were conferred:

M.D.—T. S. Blaiklock, T. L. J. Coxon, J. R. Hindmarsh, J. A. Hislop, C. F. Ind, T. F. Jarman, T. H. Kirk, R. A. Pallister, J. H. Pool, A. Swindale, W. S. Walton.

M.D.—(*Practitioners of Fifteen Years' Standing*): C. L. Balkwill, L. Gill, J. L. Hamilton, D. B. S. Jones, H. G. Peel, G. S. Phillips, E. S. Rowbotham, L. H. Terry, H. R. Tighe.

DOCTOR OF HYGIENE.—G. C. M. M'Gonigle.

M.B., B.S.—J. P. Blaiklock, E. J. Blair, W. H. Bourn, E. G. Brewis, Constance R. Caris, J. Clay, G. Davison, D. G. French, W. M. Henderson, W. M. Jones, J. C. Livingston, H. A. Lockhart, G. I. MacKinlay, J. F. M. Milner, T. Moore, G. J. Murray, Dorothy D. Nichol, Helen Ramsay, R. W. Riddle, R. W. Scott, L. M. Snaith, T. A. Stevens, Edith J. Thompson, R. T. Wordingham.

B.HY.—W. Alcock, H. H. D. Anderson.

D.P.H.—W. Alcock, H. H. D. Anderson, J. R. Hetherington.

VICTORIA UNIVERSITY OF MANCHESTER

The following candidates have been approved at the examinations indicated:

M.D.—(By examination) R. W. Luxton.

CH.M.—(Branch IV) W. F. Lambert.

FINAL M.B., CH.B.—*‡‖§D. L. Griffiths, †C. H. Gray, †W. A. B. Nicholson, †‖J. S. Parkinson, C. B. Ainscow, §Nancy Anderson, S. S. Andrew, F. Bagot, H. J. Beard, Kathleen M. Boyes, A. W. Davies, ‖B. Finkleman, B. H. Gillbanks, B. Gold, M. C. G. Israels, C. E. B. Rickards, Constance M. Rostron, R. Whittaker, D. J. Williams, R. V. Wright, P. Zimmerman. (*Part I*) *Forensic Medicine and Hygiene and Preventive Medicine*: W. E. Bowden, W. Bradley, T. W. Brindle, P. V. Cant, Edna Circuitt, H. W. Clegg, R. K. Clough, D. D. Cranna, E. Davis, F. T. Dodd, P. R. Evans, J. F. Heslop, J. Holme, W. G. H. Hughes, R. S. Hynd, R. Judson, A. R. Kennedy, Freda H. Knight, N. Launer, H. Marshall, J. C. Morris, D. C. Racker, Florence C. Read, L. Rich, Helen E. Rogerson, W. Sagar, T. P. Sewell, N. Shlosberg, J. N. Strauss, E. Vernon, C. S. Walker.

DIPLOMA IN BACTERIOLOGY.—D. T. Robinson, S. Shrikhands, A. M. Soliman.

* First-class honours. † Second-class honours.
‡ Distinction in Obstetrics. ‖ Distinction in Medicine.
§ Distinction in Forensic Medicine.

UNIVERSITY OF ABERDEEN

A graduation ceremony was held on July 7th; the following degrees were conferred:

LL.D. (HONORARY).—Dr. John Jacob Abel, Professor of Pharmacology and Experimental Therapeutics in the Johns Hopkins University since 1893.

M.D.—F. R. Selbie (highest honours for thesis), B. L. Davis (honours for thesis), F. Forman (honours for thesis), A. M. Barron, Ethel R. Emslie, J. Morrison, Margaret S. M. Reid, C. G. Walker, W. Walker.

M.B., CH.B.—A. E. Macdonald (second-class honours).

NATIONAL UNIVERSITY OF IRELAND

A meeting of the Senate was held on July 7th, under the chairmanship of the Chancellor, Mr. Eamon de Valera.

A resolution was adopted recording regret at the death of Professor Patrick T. O'Sullivan, M.D., for many years a member of the Senate of the University, and Professor of Medicine, University College, Cork.

The reports of the examiners on the results of the summer examinations, 1932, were considered, and passes, honours, etc., awarded in connexion therewith.

Dr. Denis J. Coffey, vice-chancellor of the University, was reappointed representative of the University on the General Medical Council for a further period of three years as from July 30th, 1932.

It was reported that the M.D. degree (*honoris causa*) recently voted by the Senate had been conferred upon Sister Anna Dengel, B.Sc., M.B., B.Ch., B.A.O., Foundress and First Superioress-General of the Society of Catholic Medical Missionaries.

ROYAL COLLEGE OF SURGEONS OF ENGLAND

ELECTION TO THE COUNCIL

On July 7th three Fellows were elected into the Council to fill the vacancies caused by the retirement in rotation of Mr. W. McAdam Eccles, Mr. Wilfred Trotter, and Sir Charles Gordon-Watson.

The result of the poll was as follows:

	Votes.		Plumpers.
ALFRED EDWARD WEBB-JOHNSON, C.B.E., D.S.O. (Middlesex)	965	.....	117
WILFRED TROTTER, F.R.S. (University College)	815	.....	13
GORDON GORDON-TAYLOR, O.B.E. (Middlesex)	646	.....	33
Sir Charles Gordon-Watson, K.B.E., C.M.G.	590	.....	6
William Girling Ball	404	.....	8
Henry Sessions Souttar, C.B.E.	385	.....	14
Cecil Pembrey Grey Wakeley	148	.....	4

In all 1,523 Fellows voted, including 302 resident out of Great Britain and Northern Ireland; in addition eight votes were found to be invalid.

Mr. Webb-Johnson, Mr. Trotter, and Mr. Gordon-Taylor are all elected for the full period of eight years.

LONDON INTERCOLLEGIATE SCHOLARSHIPS BOARD

The following awards of medical entrance scholarships and exhibitions have been made on the results of the Board's examinations:

UNIVERSITY COLLEGE.—*Medical Scholarship*: D. F. Eastcott; *Bucknill Scholarship*: A. D. Le Vay; *First Medical Exhibition*: M. Albert; *Second Medical Exhibition*: J. Colover.

KING'S COLLEGE.—*Warneford Scholarships*: H. W. C. Fuller, J. H. Whittles, A. J. Heriot; *Sambrooke Scholarship*: J. E. Rees.

KING'S COLLEGE HOSPITAL MEDICAL SCHOOL.—*Science Scholarship*: E. M. E. Decottignies.

LONDON HOSPITAL MEDICAL COLLEGE.—*Price Scholarship*: J. Ketcher; *Science Scholarship*: N. E. James.

The Services

DEATHS IN THE SERVICES

Major-General Gerald Cree, C.B., C.M.G., late R.A.M.C., died at Heathcote, Purbrook, Hants, on July 9th, aged 70. He was born at Stoke, Devon, on July 4th, 1862, the sixth son of the late Deputy Inspector-General E. H. Cree, M.D., R.N., was educated at Highgate School and Middlesex Hospital, and took the M.R.C.S. and L.R.C.P.Lond. in 1885. Entering the R.A.M.C. as surgeon on May 30th, 1885, he became lieutenant-colonel after twenty years' service, colonel in the long war promotion list of March 1st, 1915, and major-general on December 26th, 1917, retiring on December 12th, 1920. He served throughout the war of 1914–18, first as A.D.M.S. of the 1st and 9th Divisions, then as D.D.M.S. of the 13th Army Corps, and later as D.D.M.S. of the Lucknow Division. He was four times mentioned in dispatches, in the *London Gazette* of October 19th, 1914, January 1st, 1916, January 4th, 1917, and December 24th, 1917, and received the C.M.G. in 1915 and the C.B. in 1917; also the Russian Order of St. Anne (3rd class), and the Medaille de la Reconnaissance Française (2nd class). In 1906 he married Isabella Sophia Alice, only daughter of Surgeon General P. Broke-Smith, Army Medical Service, and leaves a daughter, who is the wife of Lieut.-Colonel J. H. Marshall, D.S.O., Indian Army.

Medical News

The summer dinner of the Australian and New Zealand Medical Association in England will be held at the Trocadero Restaurant, Piccadilly, on Friday, July 22nd, at 7.45 p.m. for 8 p.m. Mr. T. P. Dunhill, C.M.G., M.D., will preside, and Sir Henry Newland, C.B.E., D.S.O., F.R.C.S., and Mr. C. H. Fagge, M.S., F.R.C.S., will be the official guests of the Association. All medical visitors from Australia and New Zealand, whether members of the Association or not, are cordially invited to be present. The honorary secretaries are Mr. E. T. C. Milligan and Mr. Philip J. Jory, 26, Queen Anne Street, W.1. (Langham 1579.)

The seventh annual Macalister Lecture will be delivered at the National Temperance Hospital, Hampstead Road, N.W., on Thursday, July 21st, at 9 p.m., by Colonel R. J. Blackham. The subject is "Sword and scalpel, random recollections of a soldier surgeon." All medical practitioners are invited to be present, and may bring friends (ladies or gentlemen).

The Fellowship of Medicine and Post-Graduate Medical Association has made arrangements for lectures on migraine to be given by Lieut.-Colonel R. H. Elliot, at the Medical Society of London, 11, Chandos Street, W., on July 21st and 28th, at 5 p.m. These lectures are free to members of the Fellowship. On July 22nd, at the National Temperance Hospital at 8.30 p.m., the first of a series of discussion-demonstrations will take place, the subject being "Certain aspects of indigestion." There will be no fee for members. A course in urology will take place at All Saints' Hospital from August 8th to 27th, during the afternoons and evenings. Individual clinics are available every day through special arrangement with the Fellowship. Copies of all syllabuses of courses and also the list of clinics can be obtained on application to the Fellowship of Medicine, 1, Wimpole Street, W.1.

The Institute of Physics announces that the prize for the best paper published in the *Journal of Scientific Instruments* during the year 1931 is to be equally divided between Mr. H. C. H. Townend of the National Physical Laboratory, for his paper on a daylight factor integrator, and Professor E. W. Marchant, Mr. J. K. Burkitt, and Mr. A. H. Langley of the University of Liverpool, joint authors of the paper on a portable string galvanometer for use at moderate frequencies.

A quarterly court of the directors of the Society for Relief of Widows and Orphans of Medical Men was held on July 6th, when Mr. V. Warren Low, C.B., F.R.C.S., president, was in the chair. The sum of £2,119 10s. was voted to pay the half-yearly grants to the fifty widows and seven orphans in receipt of grants. The expenses of the quarter amounted to £114 3s. 2d. The sum of £911 7s. 5d. had been received from the Inland Revenue in respect of refund of income tax for the year ending April, 1932. A first application for relief was received from a widow, who had been left practically without any income. A grant of £50 per annum from the ordinary funds and one of £25 per annum from the Brickwell Fund was voted. In addition to these grants there is usually a Christmas present of £10 or £15 made in December. Dr. Egbert Morland, chairman of the propaganda subcommittee, sent an interim report. Among other suggestions for making the society better known, it was suggested that a member of the staff of each hospital be approached and asked to bring the advantages of joining the society to the notice of the newly qualified and newly married members of his hospital. Membership is open to any registered medical practitioner who at the time of his election is residing within a twenty-mile radius of Charing Cross. Full particulars may be obtained from the secretary, 11, Chandos Street, Cavendish Square, W.1.

Regulations applying to factories and workshops in which pottery is manufactured or decorated (including incidental processes) are set forth in a Homo Office leaflet just received (Statutory Rules and Orders, 1932, No. 393). They include the following items: Certain processes—namely, sieving of material after calcining of flint, grinding of flint (if machine is without water spray, or other arrangement preventing dust escape), fettling of ware by towing or sandpaper, polishing with use of flint and grinding on dry sandstone wheel, and sorting of glost ware with power-driven tool, shall not be carried out without the use of an efficient exhaust draught. The latter must also be used in several other processes. Additional measures to prevent dust arising are also insisted upon. Floors of potters' shops must be impervious, and these, together with floors of scouring shops, must be thoroughly cleaned daily by a moist method, dry cleaning by vacuum cleaner being allowable as a substitute wherever practicable.

According to a report recently made to the Office International d'Hygiène Publique in Paris by Dr. O. P. H. Atkey, there were 865 cases of cerebro-spinal fever in the Sudan with 665 deaths in 1930, as compared with 464 cases and 340 deaths in 1929 and 335 cases and 274 deaths in 1928.

Copies of the full report of the Voluntary Eugenic Sterilization Conference, which was held in May this year, can be obtained from the Eugenics Society, 20, Grosvenor Gardens, London, S.W.1.

Mr. Charles Perry Fisher has retired after fifty years' service as librarian of the College of Physicians of Philadelphia.

We are informed that the *Presse Médicale* (120, Boulevard Saint-Germain, Paris, VI) will supply syllabuses of lectures delivered at the Medical Faculty of Paris to anyone requiring them.

Letters, Notes, and Answers

All communications in regard to editorial business should be addressed to **The EDITOR, British Medical Journal, British Medical Association House, Tavistock Square, W.C.1.**

ORIGINAL ARTICLES and LETTERS forwarded for publication are understood to be offered to the *British Medical Journal* alone unless the contrary be stated. Correspondents who wish notice to be taken of their communications should authenticate them with their names, not necessarily for publication.

Authors desiring REPRINTS of their articles published in the *British Medical Journal* must communicate with the Financial Secretary and Business Manager, British Medical Association House, Tavistock Square, W.C.1, on receipt of proofs.

All communications with reference to ADVERTISEMENTS, as well as orders for copies of the *Journal*, should be addressed to the Financial Secretary and Business Manager.

The **TELEPHONE NUMBERS** of the British Medical Association and the *British Medical Journal* are *MUSEUM* 9861, 9862, 9863, and 9864 (internal exchange, four lines).

The **TELEGRAPHIC ADDRESSES** are:
EDITOR OF THE *BRITISH MEDICAL JOURNAL*, *Aitiology Westcent, London.*
FINANCIAL SECRETARY AND BUSINESS MANAGER (Advertisements, etc.), *Articulate Westcent, London.*
MEDICAL SECRETARY, *Mediscera Westcent, London.*

The address of the Irish Office of the British Medical Association is 18, Kildare Street, Dublin (telegrams: *Bacillus, Dublin*; telephone: 62550 Dublin), and of the Scottish Office, 7, Drumsheugh Gardens, Edinburgh (telegrams: *Associate, Edinburgh*; telephone: 24361 Edinburgh).

QUERIES AND ANSWERS

Tarso-metatarsal Inflammation

"FORTY YEARS A MEMBER" asks for suggestions in the treatment of a painful swelling of the tarso-metatarsal joints of the right foot, always present, but worse after exercise. All the usual anti-rheumatic remedies have been tried in vain. The patient is a woman aged 55, and otherwise healthy. The condition has persisted for six months.

Oedema of Feet

Dr. F. S. D. HOGG (Rickmansworth) writes in reply to "E. S. W.": On the chance that the condition may be due to vitamin B deficiency, I suggest trying the addition of marmite and bemax to the diet.

Abnormality of Taste

"L. G. O." (Wales) writes: In reply to "E. M. R. F." (July 9th, p. 85) I would suggest that, though the patient may have no albuminuria, a blood-urea test should be done. I should like to hear the result, if positive.

Income Tax

Restriction of Depreciation for Private Use

"H. H." is usually allowed 80 per cent. of his running expenses—the balance of 20 per cent. being set against private use of the car—and certain other expenses such as licence, insurance, and garage attendance in full. Last year he replaced his car at a cost of £107, and the inspector of taxes wishes to disallow 20 per cent. of that expense. Is that correct?

⁂ The only logical way of dealing with the restriction for private use is, in our opinion, to arrive at a reasonable percentage and apply it to *all* kinds of motor expense, and not merely to running costs. Where restriction is applied to a part of the expenses only—on presumably a percentage that would be excessive if applied to the whole—there is the obvious difficulty of deciding how to treat abnormal expenses such as cost of renewal. The only way of settling the question in any particular case seems to be to calculate the amount of private use extending over the period while the car has been in practitioner's ownership and the total disallowances for running costs. If the latter is inadequate, unless the whole of the replacement cost is being allowed, there are strong grounds for claiming the full deduction.

Renewal and Depreciation of Car

"PUZZLED" makes up his accounts as at May 11th each year. In September, 1931, he sold his old car (bought for £290 in March, 1926) for £22, and bought a 7 h.p. "T" car for £135; after May 11th, 1932, he exchanged it for an "M.M." car at a net cost of £221. (We assume for the purpose of the calculation below that he received £99 for the "T" car and paid £320 for the "M.M." car.) How should he deal with these transactions for tax purposes? He has not claimed "depreciation" in the past.

⁂ We suggest that depreciation should be claimed for 1931–2 and future years, a special request being sent to the inspector of taxes to give effect to the depreciation claim for 1931–2 against the coming second instalment. The appropriate figures are as follows:

	£
Written-down value of first car at May 11th, 1930 ...	149
Allowance to be claimed for 1931–2 at 20 per cent. ...	30
	119
Allowance for 1932–3 at 20 per cent....	24
	95
Obsolescence allowance for "T" car as an expense of the year ending May 11th, 1932—amount expended £135 – £22	113
Cost price of "T" car, bought September, 1931	135
Depreciation allowance, 1933–4, at 20 per cent.	27
	108
Obsolescence allowance for "T" car as an expense of the year ending May 11th, 1932—£135 – £27 – £99	8
Cost price of "M.M." car, bought June, 1932	320
Depreciation allowance for 1934–5	64
	256

and so on.

Use of Car: Change of Appointment

"A. F. S." purchased a car on April 1st, 1931, for £62 10s. in order to take up an assistantship for which it was essential. On July 1st he changed his post, and, as he was then provided with the use of a car, he sold his own for £35. Is the loss involved an allowable deduction?

⁂ In our opinion it would be held that the loss arose out of the change of employment, and was not incurred in carrying on the duties of the first appointment. In that case the loss is one of capital and *not* allowable. The only amount legally claimable is a reasonable sum for loss by wear and tear during the three months in question, which would probably be not less than £5 for the car in question.

Appointment: First Year's Tax

"J. L. F." took up an appointment as assistant medical officer of health in April, 1931, and his emoluments for the first year amounted to £382. He is now being applied to for the whole of the tax (£6 0s. 10d.) applicable to that income as for the year ended April 5th, 1932. Is that correct?

⁂ Yes. Tax is payable as for the first year on the basis of the income of that year. If it could have been definitely known in advance the income-tax authorities would have been justified in making the assessment last autumn, in which case £4 10s. 8d. would have been payable in January, 1932, and the balance of £1 10s. 2d. now. As the assessment was made later, the result is that both "instalments" become due now.

LETTERS, NOTES, ETC.

Local Anaesthesia for Tonsils

Dr. C. H. HAYTON (Los Angeles) writes: Here in Los Angeles the preference in adult operations is for local anaesthesia. Almost every laryngologist does the operation in his office and sends the patient home. The hospital clinics do the same—under local anaesthesia. Beds in the hospitals here are expensive. The anaesthetic is novocain (2 per cent. solution) injected in the anterior and posterior pillars and in the base. The cold wire snare is employed. The operation is simple. If care is used, and the enucleation is total (no trauma to the pillars having been done), the recovery is rapid, and primary and secondary haemorrhage rare. Since I have been in Los Angeles it is the only method I have used. Whether these happy results are due to the dryness and sunshine of the Californian climate I am unable to say.

Gangrene of the Penis

Dr. D. H. VICKERY (Neath) writes: Gangrene of the penis is a condition which receives but scant attention in surgical textbooks. As it is presumably somewhat rare, I venture to report two such cases which have recently come under my notice. (1) Following a very easily reduced paraphimosis in a man aged 60 gangrene of the foreskin set in within forty-eight hours and spread rapidly till the whole of the skin of the penis and scrotum became involved and sloughed away. In six weeks new skin gradually made good the loss, till finally one would hardly be able to discover any abnormality: no sugar in the urine. (2) In the second case the patient, aged 70, complained of irritation at the end of the penis, and in an incredibly short time the end became deeply congested and oedematous. In three days the gangrene had involved the whole foreskin and body of the penis, which in ten days sloughed completely away, invading the pubic tissues for a quarter of an inch all around the base. Here the sloughing stopped, and the parts gradually healed, leaving a very neat urethra embedded deeply in the penis. In this case a minimal amount of sugar was present.

Post-vaccinal Encephalitis

"C. M. H." writes: In reference to your article under the above heading in the *Journal* of July 9th, I think I ought to suggest that encephalitis may be somehow caused by the popular method of reinforcing lymph by passage through the rabbit. As I suspected that passage through the water buffalo was a better method of maintaining the potency of calf lymph than passage through rabbits, I issued between 1920 and 1930 roughly about 10 million doses of calf lymph which had not been on any other animal except the water buffalo since 1915. No disease except a few bad arms and generalized vaccinia was reported to me. By water buffalo I mean the variety common all over South-Eastern Asia, not the North Indian variety.

Sterilization and Abortion

Dr. B. DUNLOP (London, S.W.) writes: The rational procedure would be to make medical practitioners entirely free to accede to requests for sterilization and abortion. But there is the fear of "abuses." So I have been suggesting that these operations be made definitely legal if done on approved medical grounds or for applicants who are parents of two or more children. This compromise would remove the fear of abuses, would largely meet the problem of the carriers of defect and also the great psychological need of birth-controlling couples for a second line of defence, and yet would not raise many hard cases.

Vacancies

Notifications of offices vacant in universities, medical colleges, and of vacant resident and other appointments at hospitals, will be found at pages 38, 39, 40, 41, 44, and 45 of our advertisement columns, and advertisements as to partnerships, assistantships, and locumtenencies at pages 42 and 43.

A short summary of vacant posts notified in the advertisement columns appears in the *Supplement* at page 44.

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